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Business Information Systems

Year 4

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Jobsite for Contractors

Technical Report

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1 Executive Summary

With an increase in recent years by employers to employ people on contracts rather than permanent employees the student has looked to develop a website that will provide both jobseekers and employers with an easy to navigate and user-friendly website which will provide them with the functionality that would be expected from a website of this type. With an online presence being such an important factor for both companies and individuals nowadays, it is also important to provide companies and individuals with websites and web applications related to their careers and staff employment along with the many other services provided online nowadays. The website designed by the student will look to provide an online service that will add benefit to both employers and jobseekers when it comes to contract work market by looking to provide necessary features such as below:

- Register an account
- Create Profiles and update them
- Search and apply for contracts
- Search and contact potential candidates

The report presents the contractwork.ie website, which consists of a Graphical User Interface that the user can use to interact with the website. Data and information is stored on a MySQL database which is interacted with using PHP and SQL to store and retrieve data. This allows users to store necessary information and for it to be retrieved and searched where applicable.

The report outlines background and aims of the project, requirements set out for the project, high level description of the design and architecture of the website, and outline of main functions implemented. Any testing, customer testing, and result from any evaluations are also highlighted. Finally the student has given their conclusions in relation to the project and any further developments or research that could potentially be undertaken in relation to the project.

2 Introduction

2.1 Background

The Student decided to create this website as currently there is a lack of job search websites that are aimed specifically at the contractor job market in Ireland. There has also been a large increase in recent years for contractor roles, especially in the engineering and IT sectors, throughout Ireland. Engineering contractor roles increased by 30pc in 2011 and IT contracting roles by 8pc (O'Brien, 2012). This clearly shows a growing trend towards employing contractors mainly due to companies not being in a position to take on permanent staff due to current economic difficulties.

The student was interested in doing a website of this kind initially due to fact that they had been approached by an agency in relation to potentially doing some contract work for a company. This

led to my initial research to see if there was a website available for jobseekers to search for contract jobs in Ireland and led to the findings above.

2.2 Aims

The main aim of this project was to implement a website that could potentially fill a gap in the market, provide a useful application or tool to companies and business people, and have the potential to possibly be commercially successful in the future.

The student aimed to create an easy to navigate, interactive and efficient website that allowed jobseekers to search for potential contract roles that they may want to apply for and for companies to have the ability to post contracts to be searched. Also another desirable function of the website was to give employers the ability to search for potential contractors who have registered and saved their CV.

In terms of customers, the project is aimed at those seeking contract work and those advertising it. There was not one specific customer that requirements were gathered from and the website was designed specifically for.

However, feedback was gathered from potential customers of the website from both the jobseeker and employer side to help me define requirements and have clear aims for the project. From the contractor/jobseeker perspective the student was in contact with a colleague who has held various contractor roles in his career and 2 contractors/consultants who work for SMX Consulting. From the employer perspective the student got feedback from the HR department within the company I work, Ingersoll Rand and also from an employee in Manpower Recruitment.

The long term aim of this project would be to eventually have the website become a revenue making website. This could be achieved by charging employers to post contracts and also charging them for carrying out candidate searches. It would remain free to jobseekers. Originally though the website will be free to be used by both jobseekers and employers.

2.3 Technologies

PHP – this is a widely used scripting language especially suited for Web Development. PHP was used to add functionality to the website and for dynamic generation of web pages

SQL & MySQL – Structured Query Language used for storing, retrieving, and updating information from the database. MySQL was the open source database that I chose to use. phpMyAdmin was used to handle the administration of the MySQL database

HTML/CSS – used for displaying content, forms, etc. to users.

JavaScript – used mainly for validation of forms

WAMP – wamp package was used for installing Apache web server, MySQL and PHP on to my Windows system

NetBeans – this was the IDE (Integrated Development Environment) chosen to develop my code in

GIT – used for version control and also to back up code files

PEAR – PHP Extension and Application Library used for mail package to send authentication emails.

2.4 Structure

Chapter 1: Contains the Executive Summary which gives a short overview of what is contained in the whole report.

Chapter 2: Contains sections in relation to the project background, why it was chosen, aims of the project, and technologies used to implement the project.

Chapter 3: Describes the Functional Requirements, Data Requirements, User Requirements, Environmental Requirements and Usability Requirements along with the Design and Architecture of the overall system. Also in this chapter are sections related to how the project was implemented, any testing carried out e.g. unit testing, Graphical User Interface (GUI) layout, customer testing overview e.g. User Acceptance Testing (UAT), and finally the evaluation section of how the system was evaluated and outcome of evaluation results.

Chapter 4: Contains conclusions in relation to the project and the students overall experience of the project.

Chapter 5: Gives outline of any future developments that could potentially be implemented by the student or any further research the student may undertake in relation to the project.

Chapter 6: Contains references to resource used to complete the project and also any references within this technical report

Chapter 7: Is the appendix which contains the Project Proposal, Project Plan, Requirements Specification, and any other materials used.

3 System

3.1 Requirements

3.1.1 Functional requirements

3.1.1.1 Requirement 1 - Create Account/Register

3.1.1.1.1 Description & Priority
Functionality for users to register in order to access the website. Two account types – Jobseeker or Employers. This is a high priority requirement and having an account setup is essential to be able to login to the website

3.1.1.1.2 Requirement Activation
In the GUI, when the opening page has been opened, by clicking the 'Create one now' link or either 'Jobseekers' or 'Employers' menu options.

3.1.1.1.3 Technical issues
Database needs to be set up in order to store the information the user enters when registering. Authentication email must be sent for registration to be completed successfully

3.1.1.1.4 Risks
Access to database is denied due to server being down or other technical fault. Authentication email is not received the user to the email they registered with, which means registration cannot be completed.

3.1.1.1.5 Dependencies with other requirements
No dependencies on other requirements

3.1.1.2 Requirement 2 – Login

3.1.1.2.1 Description & Priority
On the home page the user (Jobseeker or employer) will be able to login to the website with their email and password. This is an essential requirement in order for users to use the website

3.1.1.2.2 Requirement Activation
User needs to copy link sent in activation email in to their browser to activate their account before being able to login.

3.1.1.2.3 Technical issues

Information entered by user will have to be retrieved from the database. Need to ensure database is up and running for login to be achieved.

3.1.1.2.4 Risks

Users may enter wrong email and password or forget password. Activation email never received by the user so account will not be made active for login.

3.1.1.2.5 Dependencies with other requirements

Dependent on Create Account/register requirement as without this requirement user does not have a logon to be able to login to the website.

3.1.1.3 Requirement 2 – User Profile

3.1.1.3.1 Description & Priority

Provide a section where jobseeker users can edit their profile by being able to enter certain information related to their careers, education, etc. This is a desirable requirement in order to allow a user to update their profile similar to someone would update their CV when necessary.

3.1.1.3.2 Requirement Activation

After creating an account and logging in, the user will click on the 'Edit' button which will open up the user profile information page and allow them to edit.

3.1.1.3.3 Technical issues

Information entered by user will have to be stored to the database and previously saved information will have to be retrieved. Need to ensure database is up and running.

3.1.1.3.4 Risks

Users may enter incorrect or false information.

3.1.1.3.5 Dependencies with other requirements

Dependent on Create Account and Logon requirement as without these requirements cannot login to be able to access the User Profile section.

3.1.1.4 Requirement 3 – Advertise Contracts

3.1.1.4.1 Description & Priority

Provide a way for employer users to be able to advertise contracts on the website by being able to enter certain information about the contract being offered. This is a high priority requirement as other functionality within the application will rely on advertised contracts

3.1.1.4.2 Requirement Activation

Users will click the 'Post Contract' button, once logged in, which will display a page that will allow them to enter information about the advertised contract.

3.1.1.4.3 Technical issues

Information entered by user will have to be stored to the database. Need to ensure information entered is stored correctly in the database

3.1.1.4.4 Risks

False information entered by users regarding contracts

3.1.1.4.5 Dependencies with other requirements

Dependent on Create Account and logon requirements as without these requirements cannot logon to be able to post contracts.

3.1.1.5 Requirement 4 – Contract Search

3.1.1.5.1 Description & Priority

Provide functionality for jobseekers to find suitable advertised contracts based on search criteria they have entered. This is a high priority requirement.

3.1.1.5.2 Requirement Activation

User will click the 'Contract Search' button, once they are logged in, and then enter specific search criteria. Once they are satisfied with their criteria then they will click the 'Search' button.

3.1.1.5.3 Technical issues

Ensuring the search functionality designed will actually return active and matching advertised contracts from the database

3.1.1.5.4 Risks

Main risk could be that there are currently no advertised contracts posted by employers

3.1.1.5.5 Dependencies with other requirements

Contract search results will be depend on the Advertise Contracts functionality being implemented and also user having an active account

3.1.1.6 Requirement 5 – Candidate Search (Not successfully implemented)

3.1.1.6.1 Description & Priority

Provide a search function to allow employer users to search for potential candidates based on certain search criteria they enter. This is a high priority requirement.

3.1.1.6.2 Requirement Activation

User will click the 'Search Candidates' button, once they are logged in, and then enter specific search criteria. Once they are satisfied with their criteria then they will click the 'Search' button.

3.1.1.6.3 Technical issues

Ensuring the search functionality designed will return suitable candidates based on jobseekers user profile information from the database. Need to be connected to database at all times.

3.1.1.6.4 Risks

Main risk could be that there no jobseeker users that match the employers search criteria.

3.1.1.6.5 Dependencies with other requirements

Candidate search results will depend on the User Profile function being implemented and also that employers have an active account.

3.1.1.7 Requirement 6 – User Forum (Not successfully implemented)

3.1.1.7.1 Description & Priority

Provide jobseeker users with a way to begin discussions or add replies to discussions related to the consultancy/contractor industry. Users may also just view threads without adding any content. This is a medium priority requirement.

3.1.1.7.2 Requirement Activation

Will be activated by users navigating to the User Forum section once they have logged in

3.1.1.7.3 Technical issues

Up and running connection to the database.

3.1.1.7.4 Risks

Users adding threads that are not suitable or are in no way related to the consultancy industry. Abusive replies to threads being added by users. These risks could prevent this functionality being used as intended.

3.1.1.7.5 Dependencies with other requirements

Dependent on jobseeker user being logged in.

3.1.2 Data requirements

Data that is inputted will be entered in text format and also through selection boxes and check boxes by the users. Any data entered that is necessary to kept and stored for future retrieval or update will be stored in the MySQL database.

Form validation will be in place to ensure data requirements are met when necessary such as correct email formation, password length, mandatory fields, etc.

3.1.3 User requirements

The requirements below with a strike through them were not implemented either due to time constraints or the student programming skills. Along with the user requirements highlighted below there will be the need to create an easy to navigate, user friendly and aesthetically pleasing website for users.

Consultant User Requirements
- Register Account: Able to create a jobseeker account and register certain information.
- Edit Profile: Ability to update profile information
- Contract Search: Ability to be able to enter certain search criteria to search for contracts advertised by employers
- ~~Saved Job Searches: Able to save specific job search criteria so as not to have to enter the same criteria every time they want to carry out a search.~~
- ~~Job Recommendation: Users will be able to view jobs that have been recommended as potentially being of interest to them based on the information they have entered in their user profiles.~~
- Apply for Contracts: Allows a consultant to apply for a job they have found after a search via a submission form. Can include a cover letter also.
- ~~User Forum: Allow users to be able to create and add to discussions on topics related to consultancy.~~

Employer User Requirements:
- Register Account: Able to create an employer account and register certain information.
- Edit Profile: Ability to update profile information
- Post Contracts: Allows companies to post contracts they wish to advertise to consultant users of the website
- ~~Candidate Search: employers will be able to enter certain search criteria to search for registered jobseekers that match their search criteria. A requirement highlighted by~~

~~Manpower was to have the ability to enter power strings in the keywords using operators such as AND, OR, NOT.~~

3.1.4 Environmental requirements

There will be no environmental requirements for the users as the website will be available online to be used through the internet.

3.1.5 Usability requirements

Website has to be easy to navigate and user friendly so users can move around the website without any issues and also use the functionality without needing very strong technical abilities. Try to make website aesthetically pleasing for users by having a simple but pleasing on the eye design/layout template throughout the website. Feedback from the questionnaire that was answered showed that users were pleased with the usability of the website.

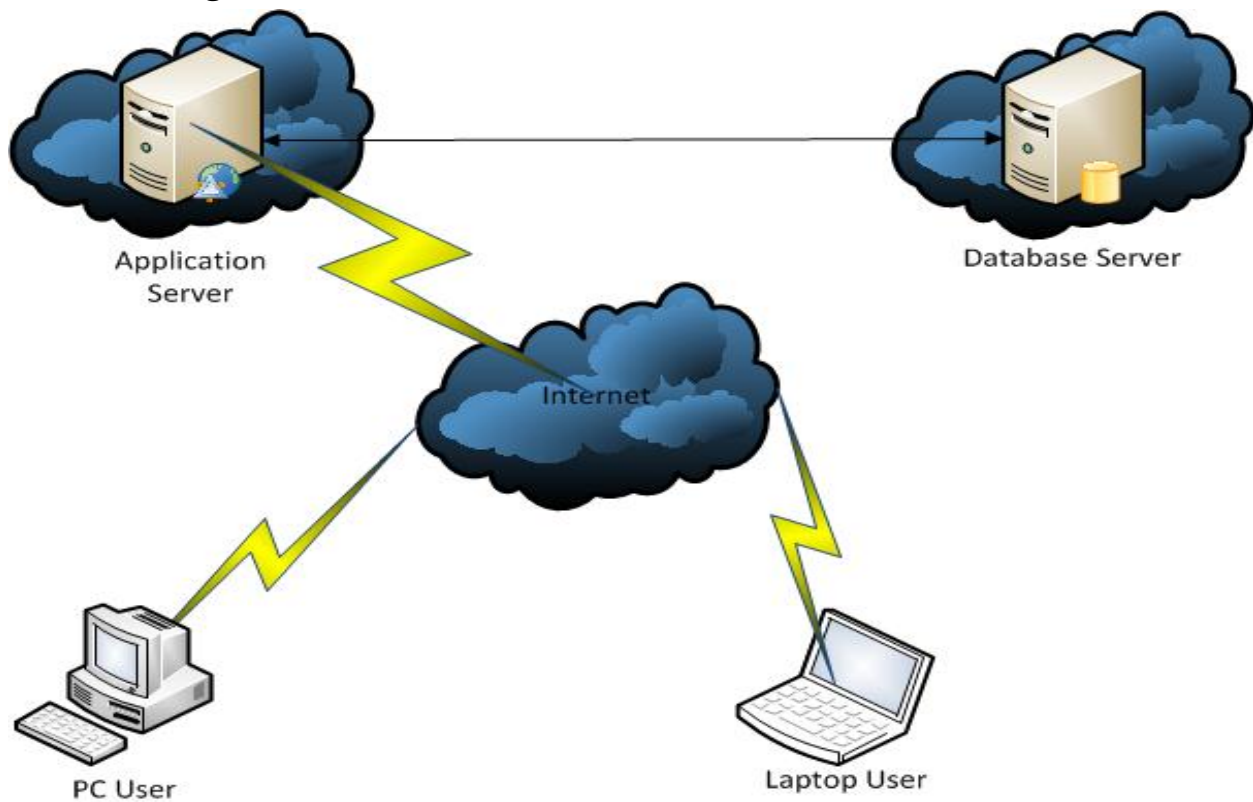## *3.2 Design and Architecture*
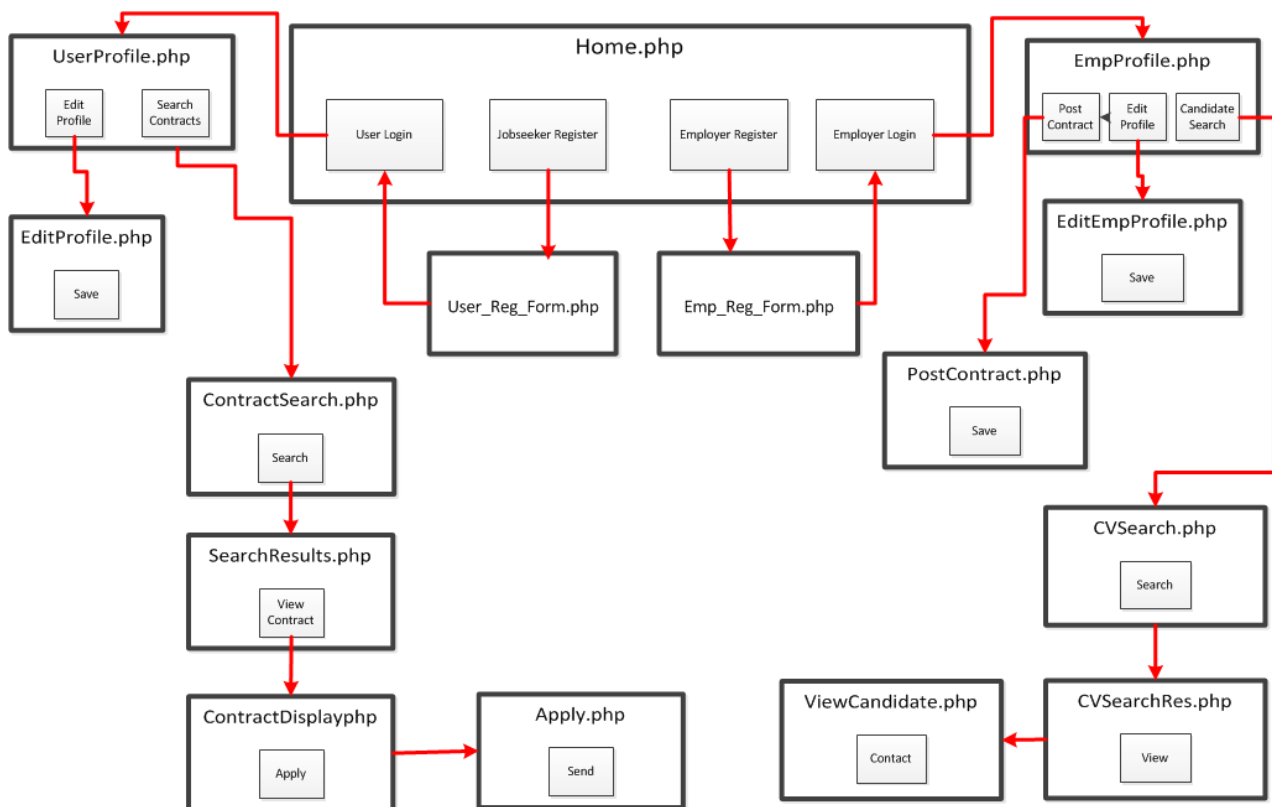

Fig1.1 –3-tier architecture diagram

Fig1.2 – Page Flow Diagram

The student used a mixture of PHP, HTML, CSS and JavaScript to design website. All information entered by users and needed for dynamic display of web pages is stored in MySQL database and interacted with to store, update, and retrieve information using PHP and SQL. The page flow of the website was intended to be kept simple but professional looking. The above page flow diagram shows the main flows and proposed flows of the website in terms of user functionality. The page flow takes a type of hierarchical approach with the home.php page being at that top of the hierarchy and acting as the gateway into the website.

Page Flow
The home page of the website and first page the user will see after navigating to the websites URL contains options to login for both jobseekers and employers. If user has not previously registered they have the option to navigate to the necessary page to do this from the home page. Once a user has logged in they are brought to their Profile page which will display particular information such as CV, Job Title, Education Level, etc. for a Jobseeker user, or Company Description, Address, etc. for an employer user, that they will have entered when registering.

Both Jobseeker and Employer users then click on the 'Edit' button which will bring them to page matching their profile page but with the ability to update their profile information and save when finished.

For a Jobseeker User they can then search for contracts based on the search criteria they enter in the Search page, e.g. keywords and/or selecting from selections lists. Once they hit the 'Search' button. Results of their search will then be displayed and users can then select a result to view the contract details and apply for the contract if they wish.

The same sort of page flow would be followed for employers as the above for Jobseekers except employers would be searching for potential candidates from the registered Jobseeker users.

Website Architecture/Design
The high level architecture, as shown in fig 1.1, would follow the same 3-tier architecture as many websites and web apps would throughout the world. The Presentation tier, which would display static and dynamic content via HTML/CSS, would be accessible over the Internet through a Web Browser from a user's PC or laptop. The Logic tier would be the coordination tier for the website and would pass and retrieve data between the Presentation tier and Data tier via PHP. This tier would hosted on an application/web server e.g. Apache for this project. Finally, the Data tier, which would store all necessary data and information on a MySQL database on a database server, would interact with the Logic tier through SQL queries sent to retrieve and update tables in the database.

3.3 Implementation

The main functions that the student has successfully implemented are the below:
- Register (Jobseekers and Employers) – both the register functions for the jobseekers and employers follow the same sequence of events. The difference between the 2 functions is that the registration information being sent to the database is different. Both functions are called when the user hits the register button on the register forms.

  The functions will take the information from the register form using the pre-defined $_POST variable and assign this information to user defined variables. Along with the form variables there is a date variable assigned (used for create date of the account and a hash variable (used for the verification URL). The database will firstly be queried to see if the email entered already exists, if it does the user will be returned to the home page with a message displayed stating this. Else the information held in the user defined variables are inserted into the necessary columns in the necessary table in the database.

  An authentication email is then sent to the user containing a URL that they will need to copy into their in order to verify their email and activate their account. The email is sent using the Mail.php package from the PEAR repository which provides the ability to send emails to users by providing SMTP authentication to link to an email account to send the mail from (in this case a gmail account the student set up).

The user will then be returned to the home page where a message will displayed advising them to check their email to activate their account. The user will then have to logon into the email account the registered with to retrieve the verification link and navigate to the link. Once the link is entered into the browser the activate user function will be called which will basically take the email and hash values attached to the end of the URL and compare them with the email and hash values stored in the database for that user to see if the match. If everything matches there account will be set to Active and they can then login using their email and password.

- Contract Search - this function will take as an input the value entered in the ContractSearch.php page. The keywords entered would be converted into an array using the explode() function provided by PHP. Each field will then be parsed using separators to separate keywords and the implode() function would then be used to do the opposite of explode and convert returned value into a string using the below algorithm:

```
 // keyword parse
 if (!empty($keyword)) {
//explode() - breaks a string into an array
   $keyword = explode(' ', $keyword);

 //parse keywords
   if (count($keyword) > 1) {
     $default = 1;

     foreach ($keyword as $value) {
      if (!empty($value)) {
       if ($default == 1)
         $key_regexp = '[[:<:]]' . $value . '[[:>:]]'; //[[:>:]] - used for specific words
       else
         $key_regexp .= '|[[:<:]]' . $value . '[[:>:]]';

       $default++;
      }
     }
//used if only one keyword entered
   } elseif (count($keyword) == 1)
     $key_regexp = '[[:<:]]' . $keyword[0] . '[[:>:]]';
//implode() - returns sring from elements of an array
   $keyword = implode(' ', $keyword);
 } else
   $key_regexp = null;

 // category parse
```

```php
if (count($category) > 1) {
  $default = 1;

  foreach ($category as $value) {
    if (!empty($value)) {
      if ($default == 1)
        $cat_regexp = '[[:<:]]' . $value . '[[:>:]]';
      else
        $cat_regexp .= '|[[:<:]]' . $value . '[[:>:]]';

      $default++;
    }
  }
} elseif (count($category) == 1)
  $cat_regexp = '[[:<:]]' . $category[0] . '[[:>:]]';
else
  $cat_regexp = null;

$category = implode(' ', $category);

// location parse
if (count($location) > 1) {
  $default = 1;

  foreach ($location as $value) {
    if (!empty($value)) {
      if ($default == 1)
        $loc_regexp = '[[:<:]]' . $value . '[[:>:]]';
      else
        $loc_regexp .= '|[[:<:]]' . $value . '[[:>:]]';

      $default++;
    }
  }
} elseif (count($location) == 1)
  $loc_regexp = '[[:<:]]' . $location[0] . '[[:>:]]';
else
  $loc_regexp = null;

$location = implode(' ', $location);
```

A sequence of If statements are then used to search the database based on various combination of search criteria. Example of one If statement below:

```
if (!empty($key_regexp)) {
    if (preg_match("/all/", $cat_regexp) && preg_match("/all/", $loc_regexp)) {

    $result = queryDatabase("SELECT JobID
                    FROM jobs
                    WHERE active = 1 AND
                        (JobTitle REGEXP '$key_regexp' OR
                         Description REGEXP '$key_regexp')
                    ORDER BY JobID DESC");
```

So if keywords are not empty and job category and location multiple selection box values are selected as 'All' then database will be searched only by the keywords entered by the user. The job title and description of contracts are the columns in the database that are searched when keywords are entered.

The final part of this function will then create a variable called $ip which will hold the ip of the client that sent the search request. This allows the server to know what client sent the request so results can be returned to that client. A While loop is used to loop through the search query to the database to see how many results there is and to also concatenate the ID's of the contracts to be stored in the search table later.

```
    while ($row = mysql_fetch_object($result)) {
      if ($default == 1)
        $fk_jobid = $row->JobID;
      else {
        $fk_jobid .= " $row->JobID";
      }

      $default++;
    }
  } else
    $fk_jobid = 'EMPTY';
```

The search table in the MySQL database is then updated with necessary information so that the results can be returned and displayed to users. The user will be redirected to the ContractBrowse.php page where they can view the returned search results. This page displays the contracts by calling the viewSearchedContracts() function.

3.4 Testing

The testing carried out by the student was all done manually but continuous throughout the development of the website. The student had looked to carry out automated Unit Testing using PHPUnit but unfortunately had difficulty in setting this up to be used in NetBeans IDE. The student systematically tested individual web pages as they were developed to ensure that individual functionality related to web pages worked as expected according to the functional requirements. If any errors were encountered the student would carry out debugging, using Xdebug in Netbeans, Xdebug allowed the user to run through the website and set breakpoints where the issue seemed to be occurring. At the breakpoint the user could step through each individual line of code and observe what values were being returned for different variables, mysql queries, etc., by referencing the debug window in NetBeans. This would allow the student to see if expected results were returning for lines of code and if not this was usually where the bug was occurring. The student would then carry out a regression test on the particular webpage to ensure the initial bug was fixed and that no new bugs had arisen.

After systematically testing pages individually the student carried out integration testing to see if individual components worked together without any issues. The student particularly wanted to test if page flows and functionality for Jobseekers and Employers were integrated seamlessly and that users would be able to navigate between the various pages as set out in the page flow diagram (fig 1.2). Also this allowed the student to test whether dynamic content entered by users on one web page was retrieved and displayed on another web page as expected.

Validation testing was then carried out by following the test cases which our contained in the appendix of this document within section 7.5. This was to ensure that the requirements set out for the project were met as expected.

3.5 Graphical User Interface (GUI) Layout

The website will be accessible and used by users through an online Web GUI which will be displayed through the chosen Web Browser of the user. This will be presented to the user through the presentation tier as described in the Design and Architecture section. HTML and CSS will be used to display the GUI to users and allow them to interact with the website. PHP in conjunction, with HTML/CSS, will allow content stored in the database to be displayed to the users in the GUI when needed. The student used the same HTML/CSS template throughout the various web pages to give the GUI the same consistent look to users. Below is a screenshot out the home.php page.

Consultants and Contractor Recruiting
Right roles. Right people. Right solutions.

Jobseekers   Employers

What does ContractWork.ie provide?

Provides people seeking consultancy or contract work with a place to search for roles of this type in companies throughout Ireland

Allows employers seeking to employ contractors or consultants a place to post contracts and to search for potential candidates

Jobseeker Functions:

> Create account/profile
> Update profile
> Search for work

Employers functions:

> Create account/employer profile
> Update employer profile
> Search for candidates

Jobseekers Sign In

Email Address:

Password:

Sign In

Don't have an account yet?

Create one now

Employers Sign In

Email Address:

Password:

Sign In

Don't have an account yet?

3.6 Customer testing

As there was not one specific customer that this project was intended for, but rather aimed at any individual looking for contract work or any employers advertising contracts or wanting to find candidates, it would have proved difficult for the student to have a customer who they could have met with on a regular basis to get specific requirements from. If this had of been done the student felt that this could have potentially led to the website being designed to the specifics and benefits of one customer rather than for the broader market the website is to be aimed at.

However, the student did conduct usability testing with potential users of the website and received their feedback through an online survey. These results are discussed in the evaluation section below.

3.7 Evaluation

The student evaluated the website through an online survey. The questions and results of the questions asked are contained in the appendix of this report. The student received a total of 19 responses to the online survey. The survey revealed the following results:

- 52.6% of respondents had used a website similar to the student's website before with 36.8% saying they had not.
- 84.2% of respondents said that they would use a service like the one provided by the student in the near future again.

- 52.6% of respondents found the website very easy to navigate and 42.1% found it moderately easy to navigate
- On a scale of 1 to 5 (1 being the lowest and 5 the highest), 42.1% rated the overall experience of the website with a 3 and 47.4% with a 4.
- 63.2% of respondents rated the variety of contracts and searches available through the website as good with remaining 36.8% saying fair
- On a scale of 1 to 5 (1 being the lowest and 5 the highest), 57.9% of respondents rated the layout and flow of the website with a 4, 31.6% with a 3, and remaining 10.5% with a 5
- Of those the responded regarding the question "If you could add further functionality to the site what would it be?" the below were the main responses received:
  - Allow for saved searches
  - Better list of jobs available
  - Job recommendations or job alerts functionality
  - A mobile version of the website
  - Ability to update & delete posted contracts
  - Candidate Search
  - Boolean search and/or improved search functionality
  - Integration with social networking sites
  - Ability to CV when registering

Overall the student feels the results were good but knows there is a lot of further development that could be done on the website as can be seen from the responses related to extra functionality people would like to see. Some of these recommendations are functionality that the student had hoped to implement and had set out in original requirements specification, such as candidate search, but was unable to deliver either due to time constraints or technical ability. Other recommendation put forward by respondents is functionality that the student had highlighted as potentially being part of future development of the website such as mobile version of the website.

4 Conclusions

Overall the project has definitely given me a good insight and understanding of what is involved in trying to implement a software project especially from the coding and programming side. I have enjoyed learning the coding side of things and what is needed to implement, from a programming perspective, this type of project. The reason I feel I have learned mostly in the programming aspect of the project is because this is first time that I have done any substantial coding especially in PHP and used an IDE such as NetBeans. I feel it has given me a good understanding of what is involved in being a programmer.

This has does not mean that I have not encountered problems throughout the project as there has been many obstacles along the way. Having to learn PHP and how to implement necessary code for my website from scratch has meant that some of the functionality I would have hoped to implement has not been possible, either due to a lack of time or my personal inexperience in

programming. Trying to resolve errors, such as syntax or non-object errors, took up quite a lot of my time and held me up progressing at the pace I would have hoped for. Other difficulties I encountered was in setting up the environment on laptop in order to be able to carry out my developments of the website

This though in my eyes is all part of the learning process and I have tried extremely hard to implement this project to the best of my ability and was extremely determined to make it work even after this process is over. There are opportunities for this project to be developed further as there is a lot of scope for a website of this nature but some of these opportunities could be potentially limited by my lack of experience and knowledge in coding more difficult functionality for the website.

5   Further development or research

There is a plenty of functionality that could be added to further develop this website but which unfortunately I did not get a chance to implement either due to time constraints or personal programming skills.

Certain functionality such as saved searches and jobs, user forum, and possibly job recommendations are areas I would have liked to have had time to implement.

There is other functionality or components that could be developed also for the website but that I would currently feel I may not have the skills to do them such as user connections similar to how Linkedin operates in building a personal network for you. Another component that could be developed would be plugin for companies to be able to connect to the website to post contracts from their internal job portals. This is something that was highlighted to me by the HR department in Ingersoll Rand back in the requirements gathering phase. There could also be the opportunity to develop a mobile app with the huge boom currently in the mobile app industry.

Further research could be carried out also to see what it would take to make the website into a commercially successful site through charging employers for posting contracts or being able to search for candidates. Also allowing advertising on the website could also be an area that could be researched further from a commercial perspective

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7 Appendix

7.1 Project Proposal

Project Proposal

Job Site for Consultants

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BSc (Hons) in Business Information Systems

Date: 26th September 2011

1   Objectives

The main objective of my software project is design a job site aimed specifically at companies looking for consultants or contract workers to work on projects they are currently doing or will be doing in the future. The site will also allow users to search for consultancy or contract jobs for projects that are advertised by companies on the site.

Potential employees will be able to create profiles for themselves. In these profiles they can add information about themselves such as skills, education, work experience, previous projects and daily rate expected. This will allow companies to search for employees based on the criteria they are looking for. This site will be aimed specifically at the Irish job market at first.

Two other features that I may potentially include for the site is the ability to connect to other users on the site, similar to Linkedin, and also a forum page where users can discuss experiences they have had working on projects in companies or to seek advice from fellow professionals.

As a BIS student I wanted to do a project that could potentially fill a gap in the market, be commercially successful and provide a useful application or tool to companies and business people.

2   Background

The reason I came up with this idea is due to the fact that recently I was approached by a recruitment agency, based in London, about a consultancy role for a company in Dublin. The recruitment agency carrying out the search for their client was not very helpful in providing me with information about the role or who exactly it was for and I eventually turned down their offer. Also the fact that the recruitment agency was based in London but their client in Dublin I found to be a bit strange and inconvenient. This is why I thought a consultancy job sited aimed at the Irish market could be of use to companies who want to find potential consultants directly themselves.

After doing some research, by simply doing some Google searches, I could not find any Irish job sites that catered specifically towards the consultancy market. The generic jobsites, such as monster.ie or jobs.ie, will have consultancy jobs advertised but sometimes these can be difficult to find within all the other full time jobs that are advertised or contract jobs that are not aimed at consultants. As the website I am going to design is specifically for consultancy roles this would not be an issue for users.

Another observation I made is that even when you can find specific consultancy jobs for projects around 50% of them are advertised by recruitments agencies. An issue I have with this is that the majority of the time these advertisements by recruitment agencies do not tell you who their client is that they are advertising for. I personally would like to know upfront who the role I am applying

for is actually with. I feel that consultants would like to know this also as they would probably move around between companies quite often and would not like to apply for a role with a company they may have had a previous bad experience with. As it will be companies advertising directly on the website I design this will mean that users will be able to see who the company is that they are applying to.

The final reason is think that this type of website could be commercially successful is down to the fact the price companies have to pay to be able to search for candidates on jobsites such as monster.ie seems to be expensive. Below is a table (Fig 1) of the prices charged by monster.ie. If I wanted to eventually make this a commercial website that I wanted to make a living from I would provide a cheaper pricing structure for companies to search for candidates. Obviously this would also require extra functionality to be added to the site in order for a payment process to be enabled and a way to track a company's duration & views. Below also is an example of a price plan (Fig 2) that I could potentially implement if the site proved to be popular and successful.

Buy CV Search

Duration	Views	Price
1 Week	50	€199
1 Week	100	€399
2 Weeks	400	€749
1 Month	1,000	€1,199
3 Months	4,000	€2,999
6 Months	5,000	€4,999
Annual	10,000	€8,499

Fig 1

Duration	Views	Price
1 week	50	€ 150
1 week	100	€ 300
2 week	400	€ 600
1 month	1000	€ 900
3 months	4000	€ 2,500
6 months	7000	€ 3,500
Annual	Unlimited	€ 7,000

Fig 2

Also companies would know that, with the website I would be providing, the registered users are people who are looking for consultancy work or have had previous consultancy experience. This

may not be the case for the conventional jobsites as they would have all type of users registered. This mean the searches that they have paid for may find them a candidate but that candidate may not be interested in consultancy role.

3 Technical Approach

I plan on following the Waterfall Model approach throughout the development cycle for this project.

1. Requirements Gathering and Analysis

2. Website Design

3. Development

4. Testing

5. Deployment

Requirements will be captured by writing Use Cases based on the functionality needed for the website to be successful.

The proposed website will be designed using the Model View Controller architecture approach consisting of a database and the Website UI. I plan on developing the front end of the website, i.e. static pages & layout, using a Content Management System such as Drupal, Joomla or Wordpress. For the dynamic pages, i.e. forms & searches, needed for updating and retrieving the database I will write the code myself. I plan on using an IDE, such as Eclipse to do this. I hope to create the back-end database using a cloud based database that can be integrated with the CMS I choose. From research I have done SQL Azure could potentially be integrated with Drupal. If this is not feasible I will develop the database using MySql or phpMyAdmin. I hope to deploy the final website and database to a cloud platform such as Windows Azure or Rackspace.
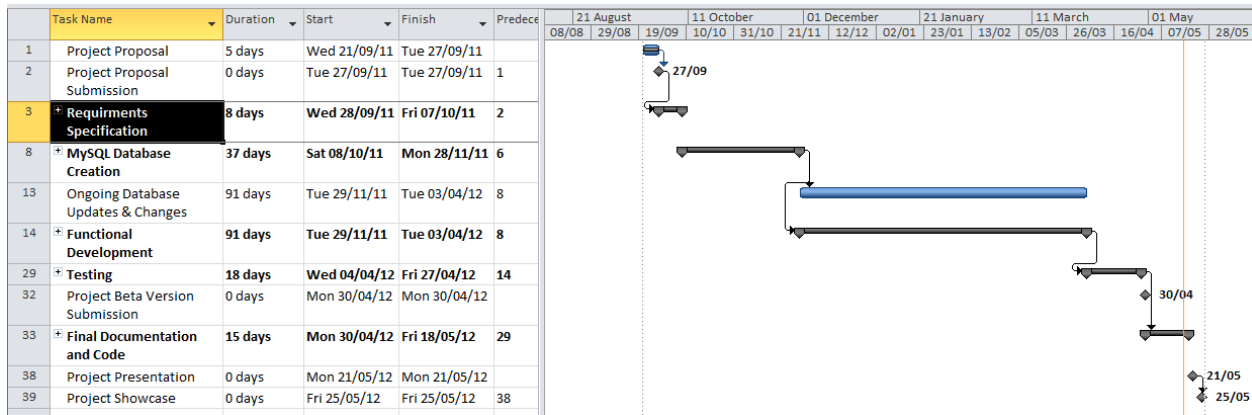
From reading various articles, blogs and websites online I feel this is the best technical approach to implement my project and at the same time use cutting edge developments in technology such as Cloud Computing.

4 Special resources required
There are not special resources that I require at this moment in time.

5 Project Plan
Below is a high level view of the phases and milestones for my project. I will be creating subtasks for the design, database, coding/development and testing phases also.

	Task Name	Duration	Start	Finish	Predece
1	Project Proposal	5 days	Wed 21/09/11	Tue 27/09/11	
2	Project Proposal Submission	0 days	Tue 27/09/11	Tue 27/09/11	1
3	+ Requirments Specification	8 days	Wed 28/09/11	Fri 07/10/11	2
8	+ MySQL Database Creation	37 days	Sat 08/10/11	Mon 28/11/11	6
13	Ongoing Database Updates & Changes	91 days	Tue 29/11/11	Tue 03/04/12	8
14	+ Functional Development	91 days	Tue 29/11/11	Tue 03/04/12	8
29	+ Testing	18 days	Wed 04/04/12	Fri 27/04/12	14
32	Project Beta Version Submission	0 days	Mon 30/04/12	Mon 30/04/12	
33	+ Final Documentation and Code	15 days	Mon 30/04/12	Fri 18/05/12	29
38	Project Presentation	0 days	Mon 21/05/12	Mon 21/05/12	
39	Project Showcase	0 days	Fri 25/05/12	Fri 25/05/12	38

6 Technical Details

The primary languages that I will be using to implement the website are HTML, CSS, PHP and SQL.

The principal coding libraries, API's and documentation I will be using are those available on the website of the CMS that I choose and the those available with the IDE I use for custom coding. I will also use any API's or documentation necessary for deploying my site to the cloud.

7 Evaluation

The testing scenarios I plan to use to evaluate the website are:

- Unit Testing – test the various software components individually to see if they work as expected.

- Integration Testing – Will be done after unit testing to ensure that components that interact with each other are working together.

- System Testing – to ensure that the website works according to the functional requirements as set out in the Use Cases

- Browser Compatibility testing – to ensure the website will display and function properly in a variety of web browsers such as IE, Mozilla Firefox, Google Chrome, etc.

- Content Testing – to ensure spelling and grammar of content displayed is correct.

- Performance Testing/Stress Testing – testing to see if the website can handle peaks in user traffic

To evaluate the website with end users I plan to carry out usability testing. I will look to get a mixture of lecturers and students from the college and provide them with tasks to carry out on the website and observe them carrying out these tasks. I will also ask them to browse the site freely and then seek feedback from them on topics such as navigation, layout, functionality, etc.

8 Consultation 1

I consulted with Paul Stynes whose feedback was positive and the application/website looked like a good idea. The advice he gave was that for BIS students the key is to have a customer that can provide you with more functional requirements. In terms of technology the application should be created as a Software As A Service which can then be deployed on the cloud. Also it would be worth searching the Internet for similar applications to get an idea of functions and to identify why your application is different.

9 Consultation 2

I also received feedback from Ron Elliot on my project proposal from a business and commercial perspective. Feedback from Ron was that he felt that a job site specifically tailored towards the consultancy industry would be interesting from a business perspective and but also offer lots of scope for a project.

10 Proposed Supervisor

I have not approached a staff member to ask them to be supervisor. I would like if the college could assign a staff member to be supervisor who would be able to give advice from a programming/technical perspective for my project.

7.2 Project Plan

	Task Name	Duration	Start	Finish	Predece
1	Project Proposal	5 days	Wed 21/09/11	Tue 27/09/11	
2	Project Proposal Submission	0 days	Tue 27/09/11	Tue 27/09/11	1
3	Requirments Specification	8 days	Wed 28/09/11	Fri 07/10/11	2
8	MySQL Database Creation	37 days	Sat 08/10/11	Mon 28/11/11	6
13	Ongoing Database Updates & Changes	91 days	Tue 29/11/11	Tue 03/04/12	8
14	Functional Development	91 days	Tue 29/11/11	Tue 03/04/12	8
29	Testing	18 days	Wed 04/04/12	Fri 27/04/12	14
32	Project Beta Version Submission	0 days	Mon 30/04/12	Mon 30/04/12	
33	Final Documentation and Code	15 days	Mon 30/04/12	Fri 18/05/12	29
38	Project Presentation	0 days	Mon 21/05/12	Mon 21/05/12	
39	Project Showcase	0 days	Fri 25/05/12	Fri 25/05/12	38

7.3 Requirement Specification

Requirements Specification (RS)

Consultants Job Application

Document Control

Revision History

Date	Version	Scope of Activity	Prepared	Reviewed	Approved
09/10/2011	1	Create	AM	X	X

Distribution List

Name	Title	Version
Paul Stynes	Lecturer II	2

Related Documents

Table of Contents

1 Introduction

1.1 Purpose

The purpose of this document is to set out the system architecture, user requirements, and requirements specification for the development of a web application for consultants and companies looking to recruit consultants.

The document also outlines the system model to be used and any potential evolution of the system. The intended customers are consultants and companies searching for consultants for specific roles or contracts.

1.2 Project Scope

The scope of the project is to develop a job portal web application, accessible via a website, which is aimed at the consultancy job market in Ireland. The application will target consultants who wish to find a consultancy role within a company who is advertising for a specific role. It will also target companies who wish to recruit consultants directly rather than paying for the help of a recruitment agency.

I have been in contact with two consultants, Mark Pyne from Ingersoll Rand and Mike Keane from SMX Consulting, to retrieve their feedback for what requirements they would expect from this application as a consultant. I have also had feedback from HR in Ingersoll Rand and Manpower Recruitment to get their input into what requirements they would expect from a company's perspective. Some of the requirements they highlighted are included in the User Requirements section and also the System Evolution section.

Consultants will have to create an account and user profile, which will enable companies to search for potential candidates based on their user profile information.

Companies will have to create an account which will then allow them post open contracts they wish to advertise, which will enable consultants to search for potential consultancy roles.

1.3 Definitions, Acronyms, and Abbreviations

HR   Human Relations
GUI   Graphical User Interface
PC   Personal Computer
UC   Use Case

2 User requirements definition

Consultant User Requirements

- User Profile: Able to create a user profile that will contain certain information. Information consultants want to be able to enter are key skills, previous experience/contracts,

education, daily rate expected, availability and locations willing to work. Also want to have to ability to update their profiles as necessary.

- Job Search: Ability to be able to enter certain search criteria to search for contracts advertised by companies

- Saved Job Searches: Able to save specific job search criteria so as not to have to enter the same criteria every time they want to carry out a search.

- Job Recommendation: Users will be able to view jobs that have been recommended as potentially being of interest to them based on the information they have entered in their user profiles. Users can choose to have e-mail notifications sent for recommendations

- Save Jobs: Can save a specific advertised contract, which is returned after a job search, to your profile for future reference.

- Apply Jobs: Allows a consultant to apply for a job they have found after a search via a submission form. Can include a cover letter also.

- User Connection: Similar to LinkedIn, allows users to connect other consultants who have created a user profile and therefore develop a network.

- User Forum: Allow users to be able to create and add to discussions on topics related to consultancy.

Company User Requirements:

- Advertise Jobs: Allows companies to post contracts they wish to advertise to consultant users of the website

- Candidate Search: Companies will be able to enter certain search criteria, such as daily rate, skills, experience, education, keywords and the system will return results of candidates that match their search criteria. A requirement highlighted by Manpower was to have the ability to enter power strings in the keywords using operators such as AND, OR, NOT.

3 System architecture

The application will be hosted on a web server and will be accessible to users through a web GUI. The database, used for data storage, will be hosted on a database server which interfaces with the web server.

As this is a web based application it will be a cross-platform solution. Users will be able to access the application using any laptop or PC that has internet access. This gives the application portability.
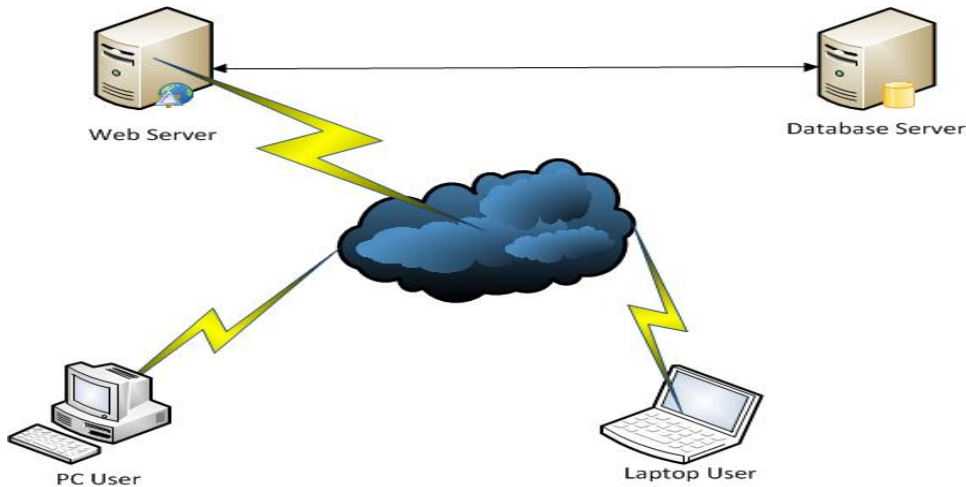
Fig 1: Consultant Job System Architecture

4 Requirements specification

4.1 Physical environment requirements

There are no physical environment requirements for the application that are within my control. As the website will be hosted on a third party server it is out of my control what physical requirements are needed to run and maintain their servers wherever they are stored.

4.2 Interface requirements

4.2.1 Graphical User Interface

The web application will be accessible to users through the GUI that is designed to provide them with ease of use. To access the GUI a user will need a PC or laptop with an internet connection. This interface is of high priority as without it users will be unable to interact with the system.

4.2.2 Database Interface

Interface required between the database server of choice, either MySQL or Microsoft SQL Server 2008, in order for data to be saved and retrieved from the designed database

4.2.3 Photo Upload

To allow consultant users to upload a photo of themselves to their user profile. Photo size should not exceed 4Mb.

4.2.4 CV Upload

Allow a consultant to upload a CV they have saved when applying for a position. Document size should not exceed 200Kb

4.3 Functional requirements

4.3.1 Requirement 1 - Create Account

4.3.1.1 Description & Priority

Functionality for users to create a user account in order to be able to login to the application. Two account types – Consultant or Employers. This is a high priority requirement and having an account setup is essential to be able to use the application

4.3.1.2 Requirement Activation

In the GUI, when the opening page has been opened, by clicking the 'Join Now' button.

4.3.1.3 Technical issues

No technical issues that can be foreseen for implementing this requirement

4.3.1.4 Risks

Access to the web server is controlled by 3rd party supplier. Need to ensure they have reliable uptime for their servers so users can access the website

4.3.1.5 Dependencies with other requirements

No dependencies on other requirements

4.3.1.6 Functional Requirements

Refer to Fig 3; Appendix 7.1

4.3.2 Requirement 2 – User Profile

4.3.2.1 Description & Priority

Provide a section where consultant users can create and edit a profile by being able to enter certain information. This is a high priority requirement and is essential for other functionality in the application to work sufficiently

4.3.2.2 Requirement Activation

After creating an account and logging in, the user will click on the 'Profile' section button which will open up the user profile information page.

4.3.2.3 Technical issues

Information entered by user will have to be stored to the database. Need to ensure correct back-end linkage between the information being sent to the database tables.

4.3.2.4 Risks

Users may enter incorrect or false information.
Users may not enter any information at all.
The 3rd party suppliers Web server being down.

4.3.2.5 Dependencies with other requirements

Dependent on Create Account requirement as without this requirement user does not have a logon to be able to access the User Profile section.

4.3.2.6 Functional Requirements

Refer to Fig 4: Appendix 7.2

4.3.3 Requirement 3 – Advertise Contracts

4.3.3.1 Description & Priority

Provide a way for employer users to be able to advertise contracts in the application by being able to enter certain information about the contract being offered. This is a high priority requirement as other functionality within the application will rely on advertised contracts

4.3.3.2 Requirement Activation

Users will click the 'Post Now' button, once logged in, which will display a page that will allow them to enter information about the advertised contract.

4.3.3.3 Technical issues

Information entered by user will have to be stored to the database. Need to ensure correct back-end linkage between the information being sent to the database tables.

4.3.3.4 Risks

No risks associated with this requirement.

4.3.3.5 Dependencies with other requirements

Dependent on Create Account requirement also as without this requirement user does not have a logon to be able to access the User Profile section.

4.3.3.6 Functional Requirements

Refer to Fig 5: Appendix 7.3

4.3.4 Requirement 4 – Contract Search

4.3.4.1 Description & Priority

Provide functionality for consultants to find suitable advertised contracts based on search criteria they have entered. This is a high priority requirement.

4.3.4.2 Requirement Activation

User will click the 'Find Contracts' button, once they are logged in, and then enter specific search criteria. Once they are satisfied with their criteria then they will click the 'Search' button.

4.3.4.3 Technical issues

Ensuring the search functionality designed will actually return active and matching advertised contracts.

4.3.4.4 Risks

Main risk could be that there are currently no advertised contracts posted by companies

4.3.4.5 Dependencies with other requirements

Contract search results will depend on the Advertise Contracts functionality being implemented also

4.3.4.6 Functional Requirements

Refer to Fig 6: Appendix 7.4

4.3.5 Requirement 5 – Candidate Search

4.3.5.1 Description & Priority

Provide a search function to allow employer users to search for potential candidates based on certain search criteria they enter. This is a high priory requirement.

4.3.5.2 Requirement Activation

User will click the 'Search Candidates' button, once they are logged in, and then enter specific search criteria. Once they are satisfied with their criteria then they will click the 'Search' button.

4.3.5.3 Technical issues

Ensuring the search functionality designed will return suitable candidates based on consultants users profile information.

4.3.5.4 Risks

Main risk could be that there no consultant users with users profile information filled out sufficiently.

4.3.5.5 Dependencies with other requirements

Candidate search results will depend on the User Profile function being implemented.

4.3.5.6 Functional Requirements

Refer to Fig 7: Appendix 7.5

4.3.6 Requirement 6 – User Forum

4.3.6.1 Description & Priority

Provide consultant users with a way to begin discussions or add replies to discussion related to the consultancy industry. Users may also just view threads without adding any content. This is a medium priority requirement.

4.3.6.2 Requirement Activation

Will be activated by users navigating to the User Forum section once they have logged in

4.3.6.3 Technical issues

There are no foreseen technical issues with this requirement

4.3.6.4 Risks

Users adding threads that are not suitable or are in no way related to the consultancy industry. Abusive replies to threads being added by users. These risks could prevent this functionality being used as intended.
Could be prevented by monitoring the forum for such occurrences and also allowing users to report any misdemeanors.

4.3.6.5 Dependencies with other requirements

There are no dependencies on other requirements

4.3.6.6 Functional Requirements

Refer to Fig 8: Appendix 7.6

4.4 Documentation requirements

4.4.1 Online help

Online help information will be supplied to both consultant and company users. This online help will describe the usage and functions of the application

4.4.2 FAQ

There will be an FAQ section for both consultant and company users. The FAQ section will provide answers to potential common questions users may ask.

4.5 Data requirements

4.5.1 Photo Upload Data Requirement

The input format will be any image files type such as .jpg, .gif, etc. for photo upload to user's profile

4.5.2 CV Upload Data Requirement

The input format will be any image files type such as .jpg, .gif, etc. for photo upload to user's profile

4.5.3 Advertisement Data Requirements

Contract/Job advertisements that are posted will expire after 30 days, unless removed before this expiration by a company. After expiration any data stored for that advertisement will be deleted.

4.6 Non-Functional Requirements

4.6.1 Performance/Response time requirement

Page load times should take no longer than 2.5 seconds for any user who is using a broadband connection.

4.6.2 Availability requirement

Application should be available 24 hours a day for everyday of the year unless the application is taken down for essential maintenance purposes. Availability could also be affected if 3rd part supplier's server were to crash but this is not within my control.

4.6.3 Recovery requirement

I will use an application, such as GitHub, to store code. This will help to retrieve code if a recovery is needed. Requirement is also needed for database recovery if failure does occur. This should hopefully be provided by the database server I choose

4.6.4 Security requirement

User authentication will be a requirement to ensure only users who have created an account/logon will be allowed access the application. Access to database on the database server will be secured by a password

4.6.5 Extendibility requirement

A future requirement for the application could be a HR system plugin to allow company's internal HR/Job Posting systems to interface with the application

5 System models

Below is a high level UC Model which shows a user's interaction with the web application use cases listed in the Functional Requirements section. Each of the web applications individual use case diagrams and flow are contained in the appendices of this document.
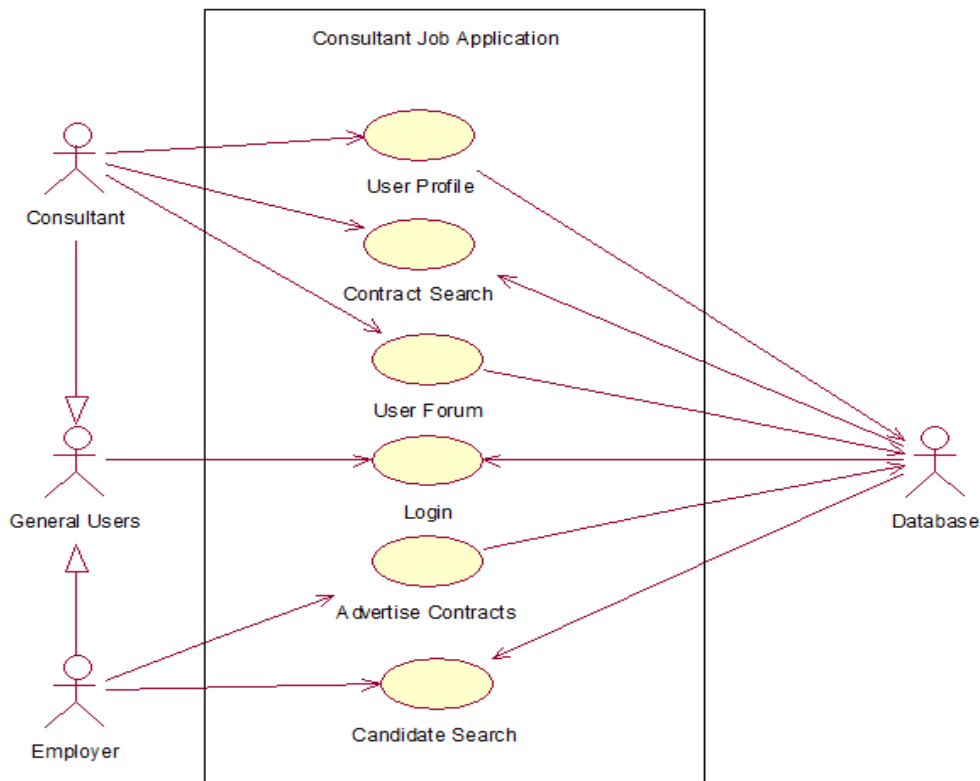
Fig 2: Application High Level Use Case Diagram

6 System evolution

The Consultant Jobs Web application could evolve in the below ways:

- User Connections – Similar to LinkedIn, allowing consultant users to search for other users and to connect with them therefore building a network for themselves. Could have functionality that suggests possible user connections or people users may know based on their existing connections.

- HR System Plugin – A potential requirement highlighted by the HR department in Ingersoll Rand was to develop a plugin that would allow the internal HR/Job posting system interface with the application. This would allow companies to post internal job posts to the application. Also could be developed to allow companies who do hire a consultant via the website to download useful information from a consultants profile into their internal HR system

- Mobile App – development of a mobile app to allow people access via smartphones

7 Appendices

7.1 Use case 1

Use case
Create Account
Scope
To allow a user create an account to be able to login into the application.
Description
This use case describes the create account process
Use Case Diagram
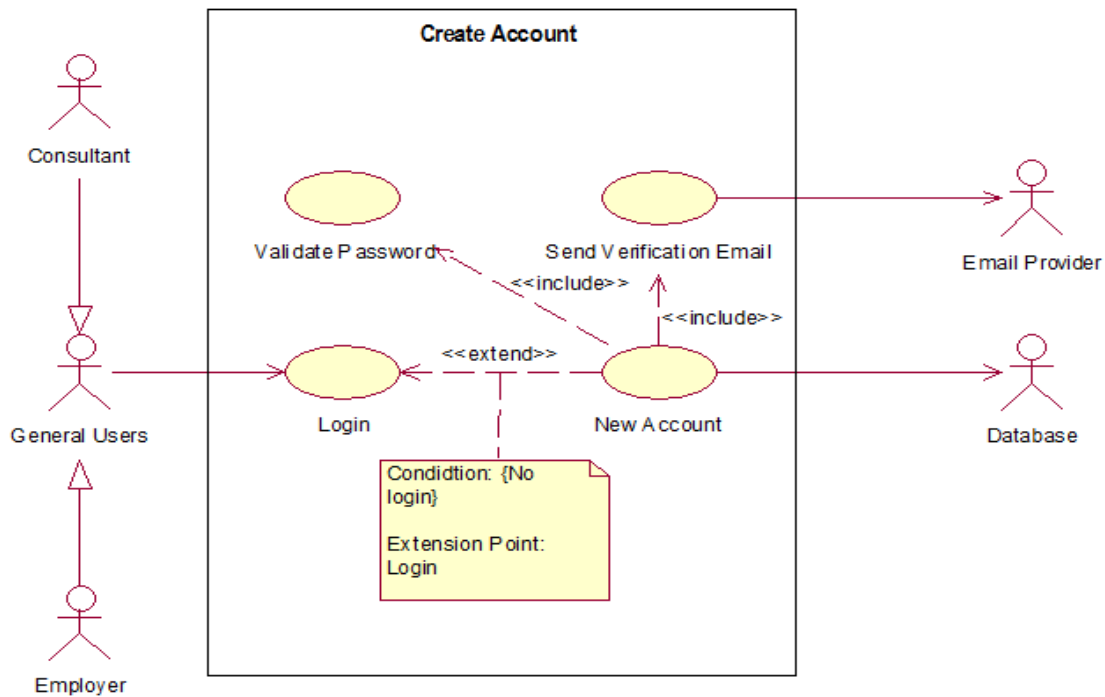
Fig 3: Create Account Use Case

Flow Description
Precondition
The user does not have a login
Activation
This use case starts when a General User clicks the 'Join Now' button
Main flow
1. The system presents the user with the new account page
2. The user enters the required information. Required information includes Email, password, first & last name, and location.
3. The system validates the password (must be 6 or more characters long)
4. The user then clicks the save button
5. The system will send an activation e-mail to the users entered Email

Alternate flow
No alternate flows
Exceptional flow
E1: Email in Use
1. The system displays a message that this email account is already used for an account

2. The user must enter another Email address or retrieve their password for existing Email address.
3. The use case continues at step 4 of the main flow

Termination
The system sends an activation e-mail
Post condition
The system goes into a wait state

7.2 Use case 2

Use case
User Profile
Scope
To allow a consultant user create and update a user profile of them in the application
Description
This use case describes the process in creating a user profile for consultant users
Use Case Diagram
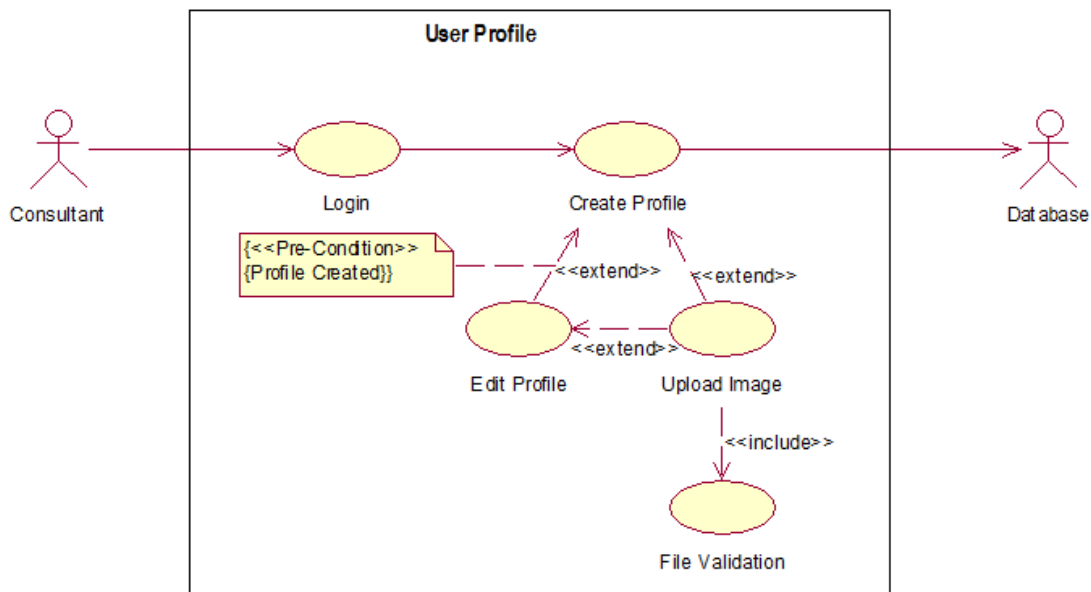
Fig 4: User Profile Use Case

Flow Description
Precondition
User has an login account created
Activation
This use case starts when a Consultant User navigates to the profile section of the application
Main flow
1. The system presents the user with the profile section page

2. The user enters information about themselves. Some of the information that can be entered by a user is previous experience, education, skills, expected daily rate, availability, etc.
3. Once user has entered their information they will click the 'Save' Button
4. System checks that required fields are filled in
5. System will save the users information to the database

Alternate flow

A1: Upload Image:
1. At step 2 in the main flow, the user may click the 'Upload Photo' button to add a picture of them to their profile
2. System presents the user with an file upload option
3. User navigates to desired file location where the image is stored using the browse function
4. The system validates the image file. Validation includes file type and file size.
5. User clicks the 'Upload Photo' button
6. The use case continues at step 3 of the main flow

A2: Edit Profile:
1. User has already created a profile and clicks the 'Edit Profile' button
2. Use case continue at step 1 of the main flow

Exceptional flow

E1: File validation error
1. System presents the user with an error message and returns the user to step 2 of the main flow

E2: Required Fields Error

1. System highlights fields that do not contain any information or correct information to the user. User must update the required fields in order to continue. System will return to step 3 of the main flow

Termination

Information is saved to the database

Post condition

The system goes into a wait state

7.3 Use case 3

Use case

Advertise Contracts

Scope

To allow an employer user to advertise contracts for consultants to view

Description

This use case describes the process for an employer user to advertise contracts on the application
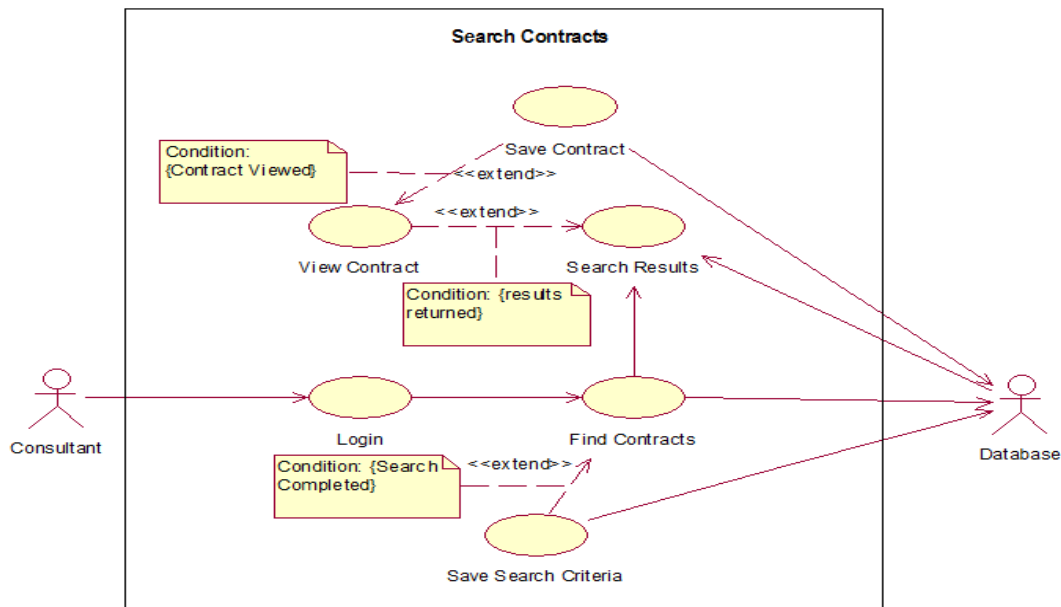
Use Case Diagram

Advertise Contracts
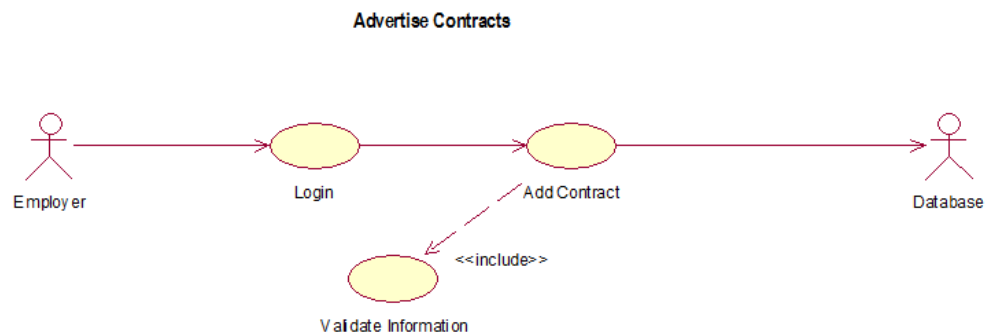
Fig 5: Advertise Contracts Use Case

Flow Description
Precondition
User has a login account created
Activation
This use case starts when an Employer User click the 'Post Now' button
Main flow
1. The system presents the user with the contract details page
2. The user enters information about the contract on offer. Some of the information that can be entered by a user is title, location, daily rate, job description, contract duration, skills required, hours, any out of hours work, working arrangement, company name, contact information, etc.
3. Once user has entered the information they will click the 'Post' Button
4. Information that is entered is validated for required fields
5. System will save the information to the database and make the advertised contract available to find
Alternate flow
There are no alternate flows for this use case
Exceptional flow
E2: Required Fields Error

1. System highlights fields that do not contain any information, or correct information, to the user. User must update the required fields in order to continue. System will return to step 3 of the main flow

Termination
Information is saved to the database and preview of advertised contract displayed to user
Post condition
The system goes into a wait state and contract is available to be found using the Contract Search use case

7.4 Use case 4

Use case
Contract Search
Scope
To allow a consultant user to search for contracts advertised by an employer
Description
This use case describes the process for a consultant user search for contracts in the application
Use Case Diagram

Fig 6: Search Contracts Use Case

Flow Description
Precondition
User has a login account created
Activation
This use case starts when a Consultant User clicks the 'Find Contracts' button
Main flow
1. The system presents the user with the contract search page
2. The user enters the criteria they want for the search. Some of the criteria that can be entered by a user are location, industry, category, keywords, company, contract length, etc.
3. Once user has entered the information they will click the 'Search' Button
4. The system will then display the search results to the user

Alternate flow
A1: View Contract

1. If the user sees a contract of interest to them the may click on the search result

2. The system will display the specific contracts information to the user

3. When user is finished viewing they may click 'Return to Results' button

4. System will bring the user back to step 4 of the main flow

A2: Save Contracts

1. If the user carries out the A1 flow, they may click the 'Save Contract' button

2. The system will save the advertised contract to the database against their account for future reference

3. The system will return the user to step 2 of the A1 flow

A3: Save Search Criteria

1. User can click the 'Save Search' after step 4 of the main flow has completed

2. The system will save the search criteria, entered by the user, against the user's account in the database for future use if they wish to carry out the same search again

3. The system will return the user to step 4 of the main flow

Exceptional flow
E1: No Search Results

1. System returns no results after the user has clicked the 'Search' button

Termination
Results are displayed to the user
Post condition
The system goes into a wait state

7.5 Use case 5

Use case
Candidate Search
Scope
To allow an employer user to search for potential candidates who have a user profile on the system
Description
This use case describes the process for an employer user to search for candidates in the system
Use Case Diagram
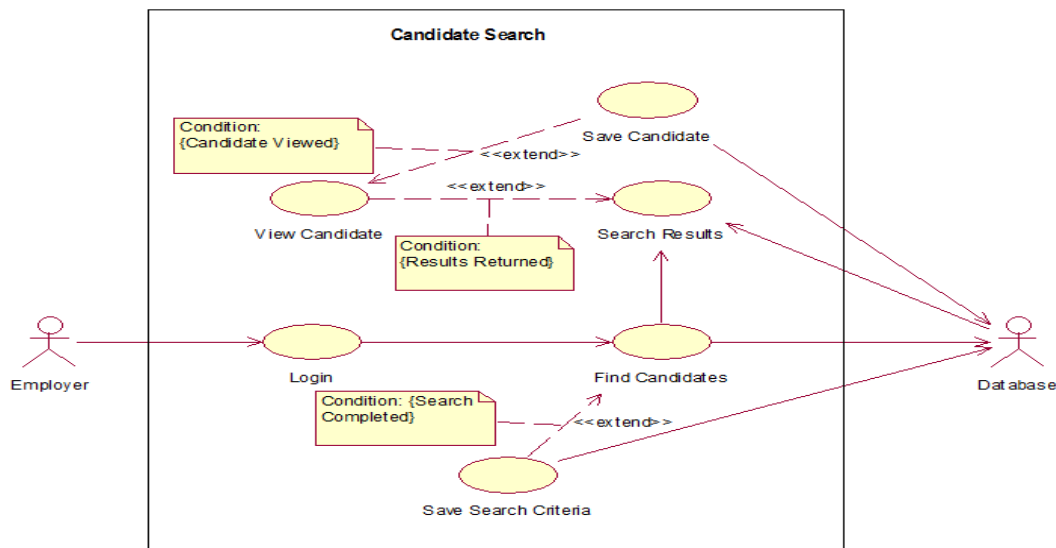
Fig 7: Candidate Search Use Case

Flow Description
Precondition
User has a login account created
Activation
This use case starts when a Employer User clicks the 'Search Candidates' button
Main flow
1. The system presents the user with the candidate search page
2. The user enters the criteria they want for the search. Some of the criteria that can be entered by a user are skills, daily rate expected, keywords, location, experience, availability, etc.
3. Once user has entered the information they will click the 'Search' Button
4. The system will then display the search results to the user

Alternate flow
A1: View Candidate

1. If the user sees a candidate of interest to them the may click on the search result

2. The system will display the candidates information to the user

3. When user is finished viewing they may click 'Return to Results' button

4. System will bring the user back to step 4 of the main flow

A2: Save Candidates

1. If the user carries out the A1 flow, they may click the 'Add Candidate' button

2. The system will save the candidates information to the database against their account for future reference

3. The system will return the user to step 2 of the A1 flow

A3: Save Search Criteria

1. User can click the 'Save Search' after step 4 of the main flow has completed

2. The system will save the search criteria, entered by the user, against the user's account in the database for future use if they wish to carry out the same search again

3. The system will return the user to step 4 of the main flow

Exceptional flow
E1: No Search Results

2. System returns no results after the user has clicked the 'Search' button

Termination
Results are displayed to the user
Post condition
The system goes into a wait state

7.6 Use case 6

Use case
User Forum
Scope
Allows consultant users to post discussions to a user forum. Also allows a consultant user to add replies to existing discussions.
Description
This use case describes the process for a consultant user to post a discussion in the user forum and the alternate flow of replying to a discussion.
Use Case Diagram
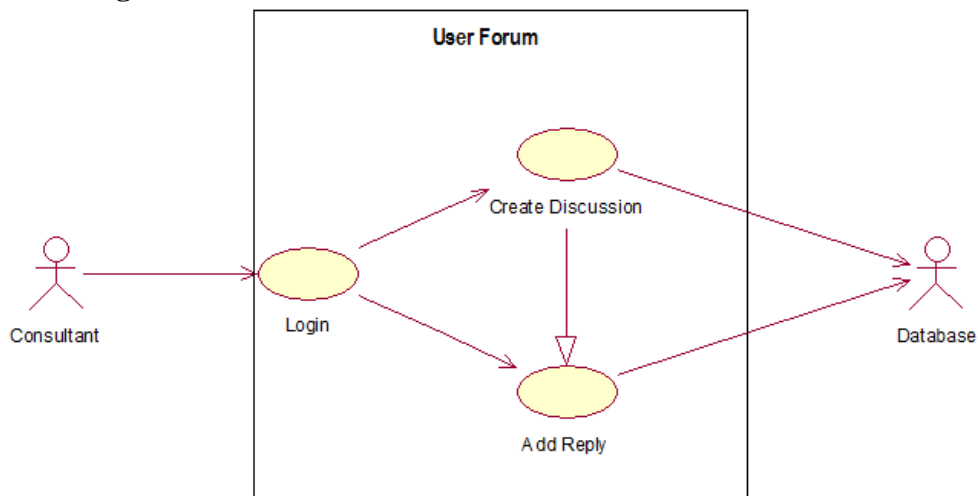
Fig 8: User Forum Use Case

Flow Description

Precondition
User has a login account created
Activation
This use case starts when a Consultant User navigates to the User Forum section
Main flow
1. The user clicks the 'Add Discussion' button
2. The system will display the a text box where the user can add text for their discussion
3. User clicks the 'Post' button
4. The system will then display the new discussion in the forum for other users to see

Alternate flow
A1: Add Reply

1. After the activation the user clicks on a posted discussion in the forum

2. System will display the information for this discussion

3. User clicks the 'Reply' button

4. System displays a text box for user to add their reply

5. User clicks post button

6. System displays users reply in the discussion thread

Exceptional flow
There are no exceptional flows for this use case
Termination
New discussion is displayed in the forum
Post condition
The system goes into a wait state

7.7 Use case 7

Use case
Apply for Contract
Scope
To allow a consultant user to apply as a candidate for a advertised contract
Description
This use case describes the process for a consultant user to be able submit an application for an advertised contract
Use Case Diagram
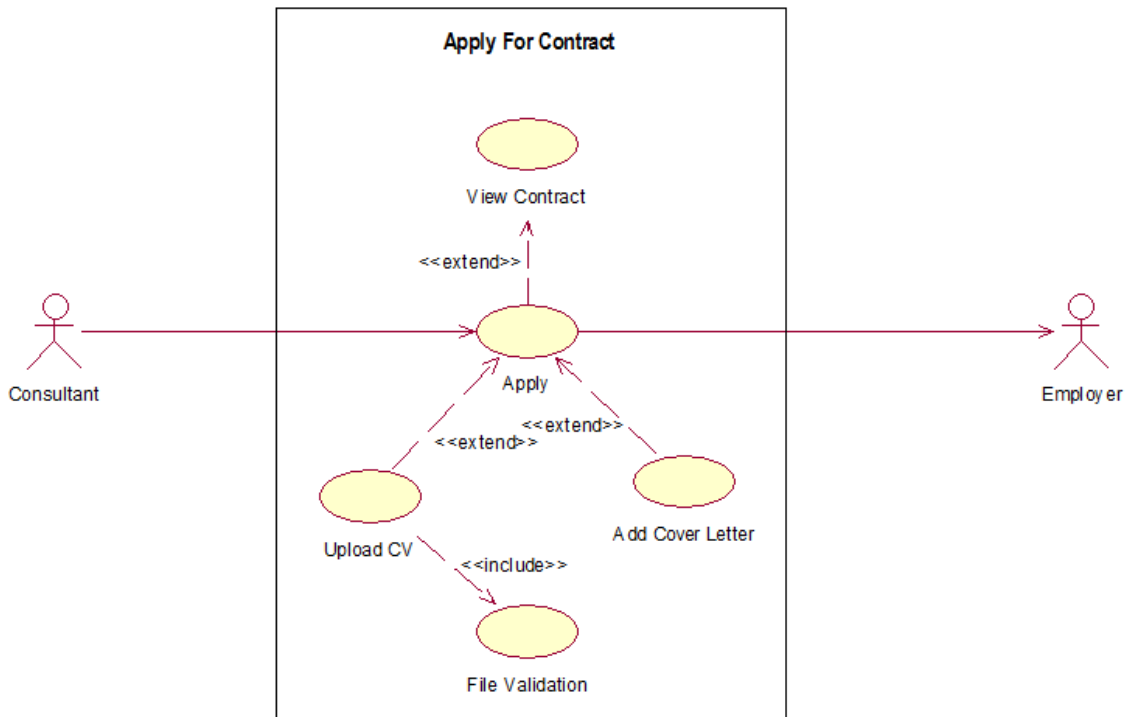
Fig 9: Contract Apply Use Case

Flow Description
Precondition
User has done a contract search and selected a returned contract result to view

Activation
This use case starts when a Consultant User clicks the 'Apply' button
Main flow
1. The system displays the apply information page
2. System displays information from users profile that will be submitted
3. User clicks the 'submit' button
Alternate flow
A1: Upload CV

1. User clicks the 'Upload CV' button at step 1

2. System displays user with file upload option

3. User navigate to desired file location and uploads file

4. System carries out validation check on file. Validation includes file type and size

5. File is uploaded and system returns to step 2 of the main flow

A2: Add cover letter

1. User checks the 'Add cover letter' checkbox

2. System displays a text box for user to type text into

3. After cover letter is typed, user is back at step 2 of the main flow

Exceptional flow
E1: File validation error
1. System presents the user with an error message and returns the user to step 2 of the main flow

Termination
User has applied for the contract

Post condition
Employer who advertised the contract receives notification of the application

7.4 Monthly log book

7.3 Other material Used

7.3.1 Test Cases

Name	TC-1: Registration
Purpose	Register for Jobseeker or Employer account
Prerequisites	Must have navigated to necessary registration form page
Steps	1. Click on 'Create One Now' link or desired link on menu button 2. Fill out all mandatory fields for the registration form (marked with *) 3. Click Register button 4. Click on 'Go to app' button 5. Click the 'Allow' button
Alternative Steps	Return to home page
Expected Results	After hitting the 'Register' button user should be returned to home page and message displayed – "Registration successful - Activate account - Check email"
Notes	User should be notified if any mandatory fields are not filled in or of any other form validation errors

Name	TC-2: Activate Account
Purpose	To activate user account after registration
Prerequisites	Must have submitted a registration form
Steps	1. Retrieve verification URL from email account provided during registration 2. Copy and paste URL into browser and hit enter
Alternative Steps	
Expected Results	After being brought to necessary page by entering the URL in the browser user should be displayed the website homepage with message displayed – "Activation successful - Login using EMAIL and PASSWORD"
Notes	If URL does not work then following message should be displayed – "The url is either invalid or you already have activated your account"

Name	TC-3: Login (Jobseekers and Employers)
Purpose	To Login to website after account has been activated
Prerequisites	Must have activated account
Steps	1. Enter Email and Password details in login form 2. Click 'Sign In' button
Alternative Steps	
Expected Results	User is re-directed to their profile page
Notes	Error messages should be displayed if login details are incorrect

Name	TC-4: Update Profile (Jobseekers and Employers)
Purpose	In order to change any information contained on profile page
Prerequisites	Must be logged in and be on the profile page
Steps	1. Click 'Edit' button on the profile page 2. Change any details that are currently saved for the user or add any new details as necessary 3. Hit 'Save' button when finsihed
Alternative Steps	User can hit the 'Cancel' button and be returned to their profile page
Expected Results	User is re-directed to their profile page after clicking 'Save' and updated information is displayed
Notes	Error messages should be displayed if mandatory fields are left blank

Name	TC-5: Post Contract (Employers)
Purpose	Allow Employer users to post contracts to the website
Prerequisites	Must be logged in
Steps	1. Click 'Post Contract' link from the menu bar 2. Fill in mandatory fields (marked with *) 3. Click 'Insert' button
Alternative Steps	Can click 'Profile' link in menu to return to profile
Expected Results	Contract details stored on database and message displayed – "Contract Inserted successfully"
Notes	Error messages should be displayed if mandatory fields are left blank

Name	TC-6: Search Contract (Jobseekers)

Purpose	Jobseeker users can search for contracts posted by employers
Prerequisites	Must be logged in
Steps	1. Click 'Search Contracts' link from the menu bar 2. Enter search criteria 3. Click 'Search' button
Alternative Steps	Can click 'Profile' link in menu to return to profile
Expected Results	Search results displayed to user based on search criteria entered
Notes	

Name	TC-7: Apply (Jobseekers)
Purpose	Jobseeker can apply for contracts returned in search results
Prerequisites	Must be logged in and have clicked link to desired contract
Steps	1. Click on 'Apply for this Contract' link 2. Enter mandatory details and attach CV. Enter optional details if user wishes to do so 3. Click 'Apply' button
Alternative Steps	User can close job details window and return to search results without applying
Expected Results	Entered details and attachments sent to employer advertising contract
Notes	Warning message and form validation errors should display where required

7.3.2 Online Survey

1. Have you previously used a service similar to contractwork.ie before?

○ Yes

○ No

○ Not Sure

2. Do you think you will use a service like this in the near future?

○ Yes

○ No

○ Not Sure

3. How easy is it to navigate Contrackwork.ie?

○ Extremely easy

○ Very easy

○ Moderately easy

○ Slightly easy

○ Not at all easy

4. If you selected not at all easy please specify why

5. How would you rate the overall experience? (1 being the lowest 5 being the highest)

○ 1

○ 2

○ 3
○ 4
○ 5

6. How would you rate the variety of contracts posted and searches available?

○ Poor

○ Fair

○ Good

○ Excellent

7. How would you rate the layout and flow of the website? (1 being the lowest 5 being the highest)

○ 1

○ 2

○ 3

○ 4

○ 5

8. If you could add further functionality to the site what would it be?

Survey Results

Response Summary

PAGE: 1

1. Have you previously used a service similar to contractwork.ie before?		Create Chart ↓ Download
	Response Percent	Response Count
Yes	52.6%	10
No	36.8%	7
Not Sure	10.5%	2
	answered question	19
	skipped question	0

2. Do you think you will use a service like this in the near future?		Create Chart ↓ Download
	Response Percent	Response Count
Yes	84.2%	16
No	5.3%	1
Not Sure	10.5%	2
	answered question	19
	skipped question	0

3. How easy is it to navigate Contrackwork.ie?

		Response Percent	Response Count
Extremely easy	▬	5.3%	1
Very easy	▬▬▬▬▬	52.6%	10
Moderately easy	▬▬▬▬	42.1%	8
Slightly easy		0.0%	0
Not at all easy		0.0%	0
		answered question	19
		skipped question	0

4. If you selected not at all easy please specify why

	Response Count
	0
answered question	0
skipped question	19

5. How would you rate the overall experience? (1 being the lowest 5 being the highest)

🍥 Create Chart ⬇ Download

	Response Percent	Response Count
1	0.0%	0
2	5.3%	1
3	42.1%	8
4	47.4%	9
5	5.3%	1
answered question		19
skipped question		0

6. How would you rate the variety of contracts posted and searches available?

🍥 Create Chart ⬇ Download

	Response Percent	Response Count
Poor	0.0%	0
Fair	36.8%	7
Good	63.2%	12
Excellent	0.0%	0
answered question		19
skipped question		0

7. How would you rate the layout and flow of the website? (1 being the lowest 5 being the highest)

Create Chart   Download

		Response Percent	Response Count
1		0.0%	0
2		0.0%	0
3		31.6%	6
4		57.9%	11
5		10.5%	2
	answered question		19
	skipped question		0

8. If you could add further functionality to the site what would it be?

Download

		Response Count
	Show Responses	9
	answered question	9
	skipped question	10