

**Course Name: M.Sc. in Computer Science (Conversion)**

**Module Name: Internet Technologies**

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**Assignment Title: Internet Technologies and Web Design**

**Web Site address: [www.rat.ie](http://www.rat.ie) (Login Details in Appendices)**

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**Abstract: The purpose of this report is to explain the business context, content, design and technical considerations in setting up the web site [www.rat.ie](http://www.rat.ie)**

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## **Introduction**

The idea for the site developed from involvement in recreational sports activities in the evenings after work hours. With a burgeoning young work-force often from outside the capital and the demand for team sports there are business opportunities in the sports and recreation field. The domain to host the site had to be catchy with possible advertising angles. The idea behind the site originated from the perceived lack of infrastructure for new arrivals in Dublin who want to continue playing soccer in a competitive but structured environment.

## **Business Issues**

The context of the website [www.rat.ie](http://www.rat.ie) is the increased young urban workforce in the Dublin area, the demand for sports opportunities after work hours and the continuing demand for access to opportunities to play soccer as a competitive sport at an amateur level. Between 1999 and 2011, it is estimated that Dublin added approximately 150,000 jobs, almost a 30% increase despite the recent economic contraction (Dublin Chamber of Commerce, 2014). The Greater Dublin Area accounted for 39.3% of the population in 2011, and this will rise to 42.4% in 2031 under the Central Statistics Office's projections using the traditional migration patterns (RTE News, Dec. 2013). As a result the population of Dublin is projected to increase to 2.1 million by 2021. In tandem with this population increase is the burgeoning demand for after work team sports opportunities with soccer being the most popular team sport (ESRI, 2004. P.22)). Online sports classified ads and community sites such as "gumtree community blog" are peppered with requests to join teams, find players and join leagues (Gumtree, 2014). If you have a ready-made team it is easy to locate an extra player for a team or join a league but if you are a new entrant to the Dublin scene there is no website to help you create, form or join a team. You can book an astro-pitch any night with [astropark.ie](http://astropark.ie) and you can join a league with [astro.ie](http://astro.ie) but there is no website where you can form a team based on the criteria location, competency, field-position and availability. This is the business opportunity that this website proposes to exploit.

The website is not part of a business organisation but is part of the sports and recreation economy which is now recognised as having multiple business opportunities given the amount of degree courses now on offer. The aim of the site is to feed into existing structures. Once a team is compiled or completed using [www.rat.ie](http://www.rat.ie), an astro-pitch can be booked

through [www.astropark.ie](http://www.astropark.ie) or an existing league can be joined through [www.astro.ie](http://www.astro.ie). In this way the site feeds into an existing sports and recreation web based business structure while successfully creating another function to the organisation which facilitates its overall success.

The site development is phased over a specific period of time. The initial phase is to build a working database over a three month period through word of mouth, advertising and social media. This initial phase has to be intensive and productive otherwise the database would become a 'white elephant'; the initiative would be lost and those who had signed up would lose confidence in the process. All those who sign up would have to be informed of progress. Once a working database has been developed the second phase would start (figure 1). An online form to query the database would be uploaded to the site producing results based on the database criteria. This stage would make the site a productive unit. The database would continue to build and be updated and the site would continue to evolve and develop according to feedback from members and the demands of site management. Later stages would have to include interfacing with other organisations in developing league structures, renting of pitches for internal leagues and updating of website interfaces to simplify processes for members.

Economic producing potential of the website; advertising, fee per game, subscription etc. would only emerge at later phases if and when the database became an essential part in the planning and organising of amateur soccer teams and leagues throughout the Dublin region. These possibilities will only emerge if the initial phases are a success and the database is sufficiently populated and updated to become an indispensable resource in team creation and planning. The business opportunities would emerge from the utilisation of an extensive database to produce a product that members both suggest and want. Feedback to the site is essential in building a profile of user needs. A speedy response to user needs at early stages will build confidence in the reliability of the interface. Further development is possible by including other sports in the long term. With that intention in mind rat (acronym for roundup a team) was chosen over raft (acronym for roundup a football team) so that the site wouldn't be limited to just football. Similarly the initial focus is on Dublin but can be widened to other urban or rural areas once a successfully run product is established.

Server: localhost » Database: r561250\_player\_details » Table: Player\_Database

Showing rows 0 - 5 (6 total, Query took 0.0006 sec)

SELECT \* FROM `Player\_Database`

Number of rows: 25

Sort by key: None

	id	family_name	first_name	email	mobile	area	days_available	time	competency	field_positi
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	3	Crosby	John	podge10000@gmail.com	0876921820	Dublin2	Tuesday	19.00-20.00	intermediate	goalie
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	5	Kennedy	Patrick	pgocinneide@gmail.com	0876921820	Dublin4	Tuesday	19.00-20.00	beginner	defender
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	6	Emirson	Patrick	mkennedy@gmail.com	0879456324	Dublin2	Thursday	19.00-20.00	skilled	defender
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	7	kennedy	padraig	podge10000@gmail.com	0871266396	Dublin4	Friday	19.00-20.00	intermediate	midfield
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	9	Emirson	John	pk6thclass@gmail.com	0876921820	Dublin1	Array	18.00-19.00	intermediate	defender

Figure 1 Player details database

The initial cost of setting up and hosting the website has to be seen as a long term investment with no immediate pay-out. The site is part of a free service product and if it becomes an essential and invaluable service to multiple users the economic benefits emerge indirectly in advertising and production of other services that users need and request i.e. venue booking, inter area leagues, leagues at different levels of ability. The economic potential of the website will therefore be totally dependent on the success of the initial phases of database building. The idea has to be clear and instinctual, the interface friendly and accessible and information has to be easily retrievable.

The domain ww.rat.ie incurs a recurring annual bill of €9.95 and a recurring bill of €39.95 hosting with Hosting Ireland. This hosting account gives access to phpMyAdmin for the creation and querying of databases, email webmail account creation and Auto Responders. Buying a domain allows you to match the web address to the product being provided. The

purchase of an accompanying hosting service provides an immediate platform for the creation and querying of databases, the upload of data, and the creation of webmail and the management of files. It provides greater security of data and helps to protect the identity of respondents and it also guarantees safe backup services (Pandya, B. 2013).

## **Website Content**

The success of the website is dependent on the visitors being both user and product; its central purpose is for each user to sign up to the database. Based on this premise the design of the site has to be clear, clean and intuitive. The aim in developing the site was to minimize clutter, distraction and gimmickry and emphasise clarity and simplicity. The site needed to create confidence in its professionalism, consistency and currency.

The site was structured on these principles. The welcome page or index clearly explains the purpose of the site and directs users to the form page to input details. These form details are stored in the player details database (figure 1). The contact page has a simple input form to accept feedback, suggestions and requests and goes to the domain email address triggering an automated response. The other pages - regulations, gallery and location - are not essential but necessary for the overall impression and feel of a completed site. The gallery page has an input form on the right panel which allows users to upload their own photos. These are stored in a database and are uploaded by the administrator to the rat.ie Flickr account album and are subsequently displayed in a slideshow on the welcome page. As user feedback is essential in understanding the needs of participants the welcome page has a right panel on the right side which has an embedded twitter feed and the regulations page has a chat box. These elements maximize the opportunity for feedback and also create a dynamic evolving user driven website.

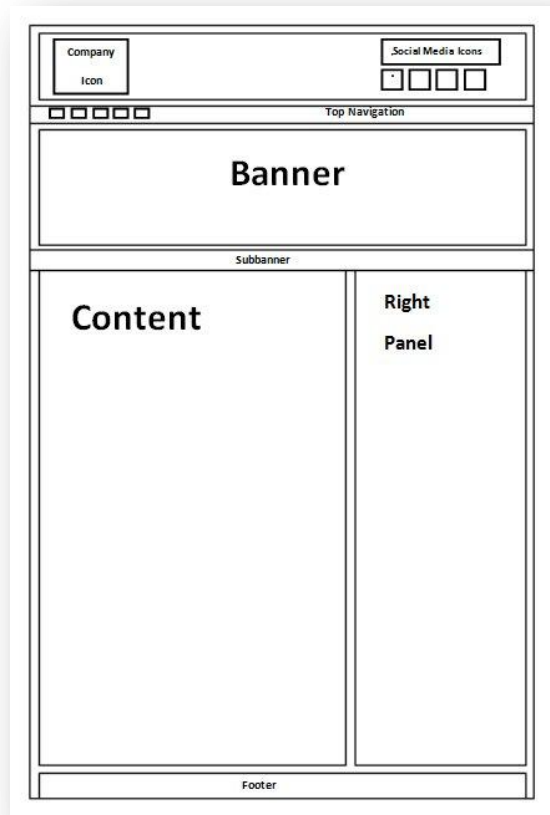


Figure 2 Wireframe of [www.rat.ie](http://www.rat.ie)

To maintain a continuity and fluidity in inter-page browsing each page was designed on the same wireframe template (figure 2). Each section was marked with the html divider tags and the layout, fonts and alignment were styles with Cascading Style Sheets (css); the file stored in the css folder. This separation improves content accessibility, affords more flexibility and control in the specification of appearance characteristics, enable multiple pages to share formatting, and reduce intricacy and repetition in the structural content. The only files in the public\_html are the web pages and all server side-scripting php code which controls access to databases, processes user input into contact forms and user downloaded images are stored in a separate folder (figure 3). The images folder is subdivided into icons and gallery and further subdivided into thumbnails. By setting up a clear directory structure it allows the website to develop a more complex interconnectedness.

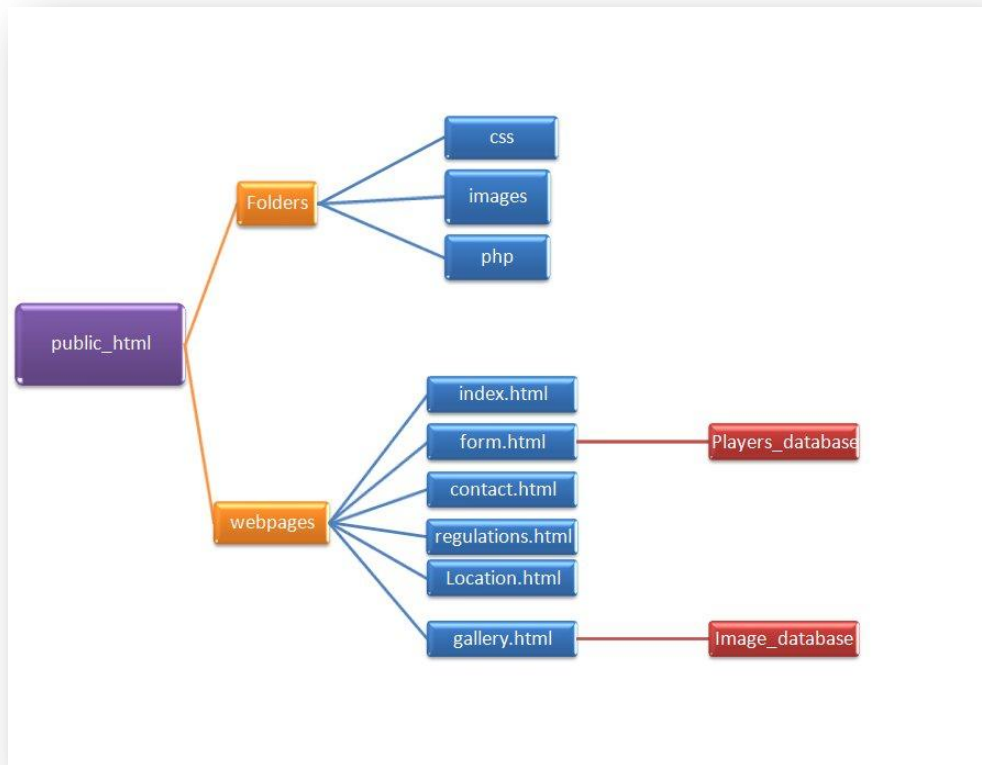


Figure 3 Simple schematic diagram of [www.rat.ie](http://www.rat.ie)

Cascading Style Sheets were used to format all of the content. Best practice was followed in choosing ID selectors, grouped selectors and contextual selectors (Granell, Craig 2007). To improve browser compatibilities zeroing margins and padding on all elements was chosen. Meta tags such as 'revisit-after' were selected to assist search engine crawlers. Once the CSS file was set up tweaking of individual elements was possible in Dreamweaver and it automatically updated the css style sheet. The foremost tool for writing scalable style sheets is the "em" unit so all fonts were defined in pixels thereby guaranteeing a consistency across browsers and complying with The World Wide Web Consortium (W3C) recommendations. The (W3C) validators, all of which are combined in Unicorn were used to check for errors (Unicorn, 1994- 2014). Not including an alt attribute on images was the most common error



which gives textual clues when image problems develop as the result slower browsers. All the website pages were checked for compatibility on the major browsers, IE, Chrome, and Firefox.

## Website Design

As the site is dependent on user input the design had to inspire confidence and grant it an immediate first view confidence assurance check (Mc Alpine, R. 2012). Each page has to encourage input and funnel users to the action page to fill in their details to be submitted to the player database. The content and design has to promote credibility and the browsing experience has to be consistent and clear. The site depends on it being usable and intuitive; with a minimum of clicks the intention should be clear, input easily realized and an immediate response received (Boettcher, B. May 2010). To guarantee success in creating a business website that requires user input it has to be a professional, error free experience for users because once launched its success is dependent on reliability and consistency.

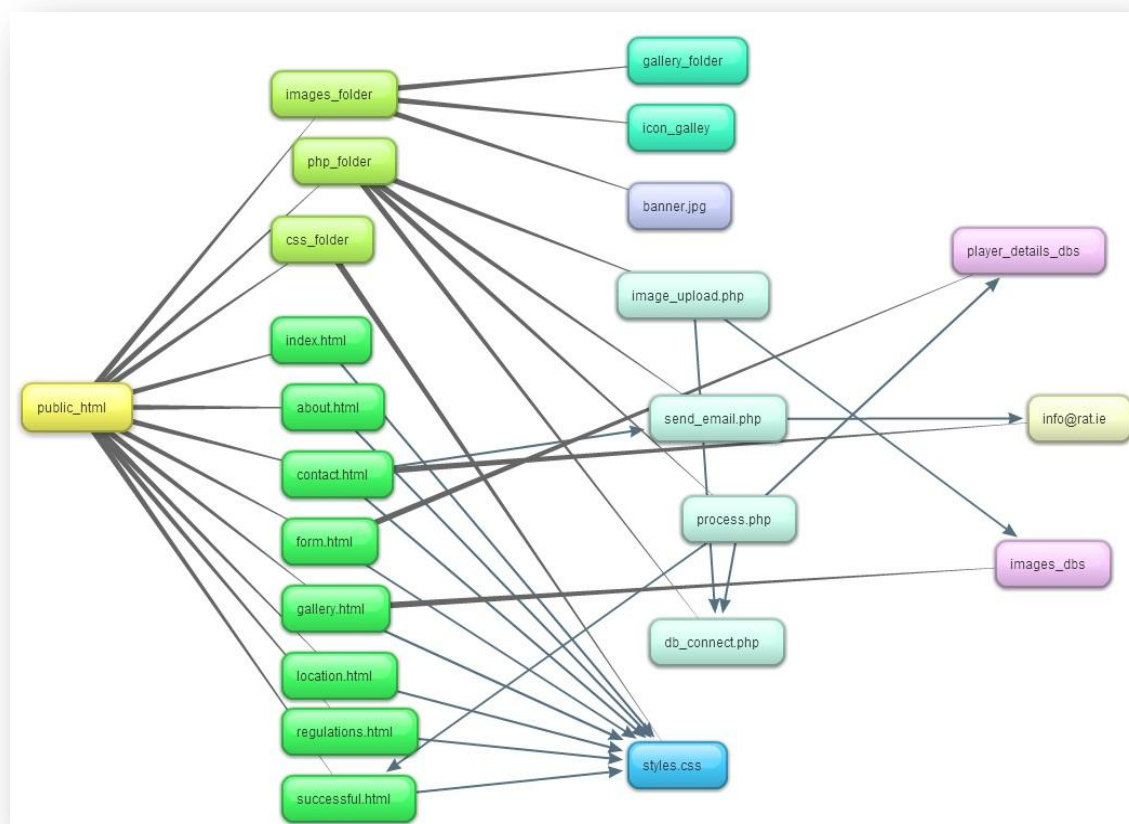


Figure 4 Detailed schematic of website showing the interconnections

The website could not be a static information website but had to be a dynamic interactive experience to stimulate user interest and encourage participation. To achieve this there had to be multiple input and feedback opportunities (figure 4). The aim of the index/welcome page is to help the user to quickly decide whether the site was relevant to their needs or not. Once that initial decision was made the user is directed to filling up the form to feed into the database. On completion the site is directed to a thank you page. Other pages convey a community of active participants in an ongoing process (Knight, J, and March 2012). The player database will eventually feed into a query form giving immediate feedback on a number of different fields (name, mobile, area, competency, field position) which would fulfil its function of finding a player to complete a team as distinct from forming a team. The photos uploaded by users into a database already feed into the content on the homepage (figure 5). In the long term it will be necessary to develop an image CMS (Content Management System) where the photos stored will automatically feed into the gallery based on timestamp thereby reducing the administrator's role (Vasont Systems, 2014). This was outside the potential and current capabilities of this project administrator.

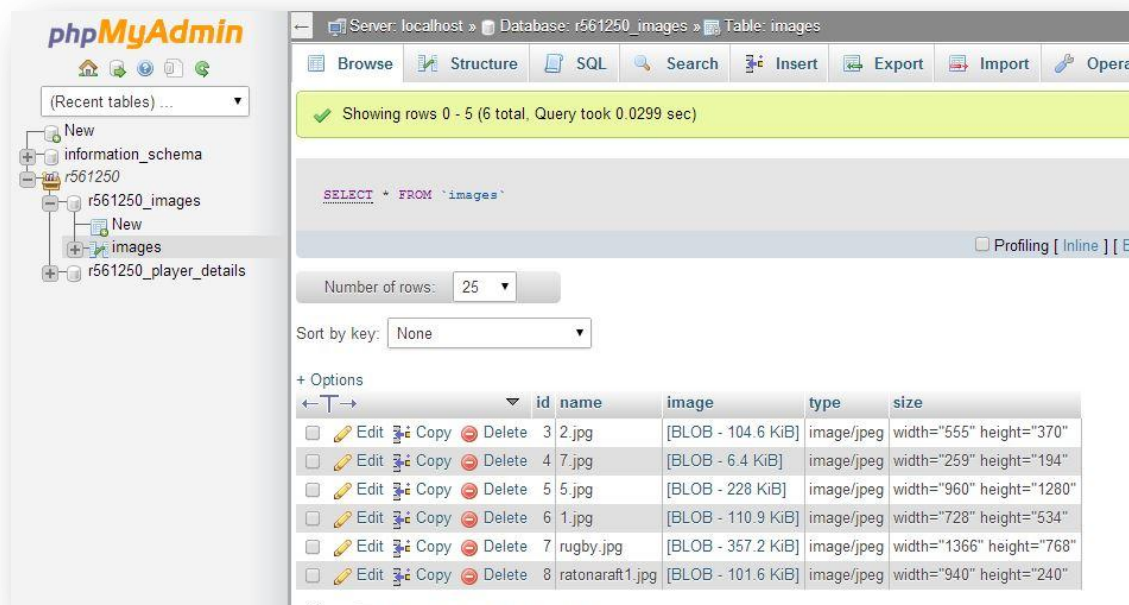


Figure 5 Photo database

It was necessary to design company logos and a banner to capture the user's initial attention. Macromedia Fireworks was used to edit graphics and add different layers to the banner (figure 6). The banner was resized in Fireworks to the width of the wrapper and the image colour and brightness was adjusted in Paint Shop Pro 5. The styling of the fonts, icons and alignment were controlled by the style sheet by reference to the different dividers and elements on the page; wrapper, top, logo, social-media icons, top-navigation, banner, sub-banner, content, right-panel, and footnote. The social media icons lead to web pages based on the site concept so as not to direct users away from the site. The icons were resized in Paint Shop Pro 5 and resampled so that they were a smaller file size. The information on the welcome page had to be succinct and focused. The form was designed in Macromedia Dreamweaver and the validation in design mode permits making input fields required (Brett, T, July 2010). The images in the gallery page are thumbnails of the larger image and when clicked open up the larger image (figure 6). These images were all resized to the same width and length to improve the aesthetic of the page.

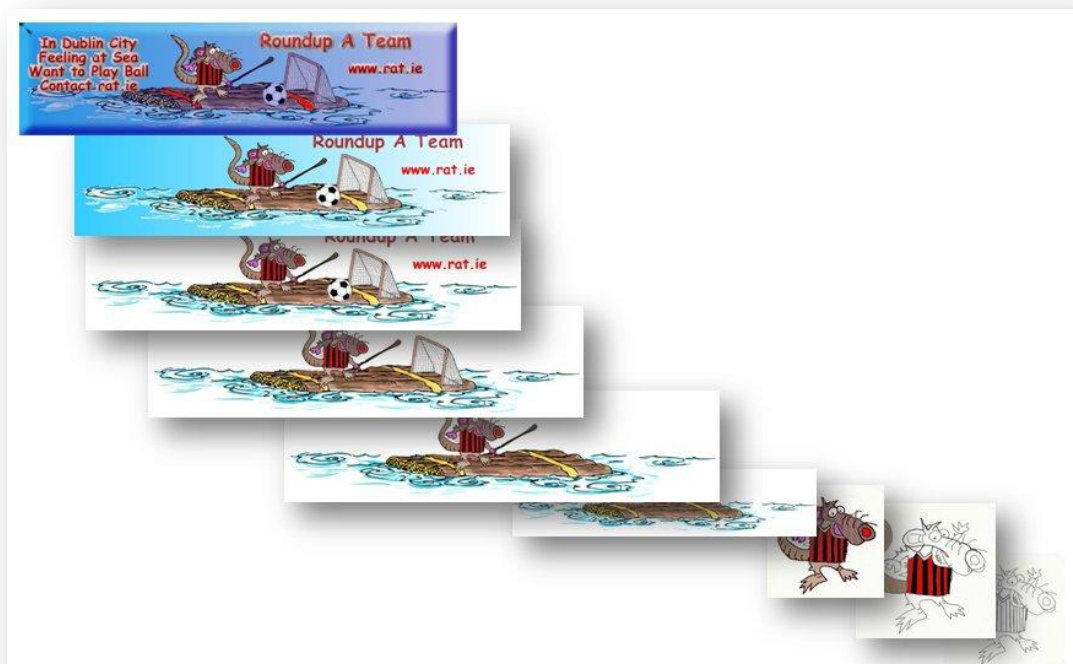


Figure 6 Creating the banner in layers using Macromedia Fireworks

The difficult aspect in creating a dynamic site that involves inputs and responses is not in the html code that creates the forms and the web pages but in writing the php side scripts to dictate the path of the data and the responses triggered. PHP is a server scripting language used to make web pages interactive. Php code is a long process of trial and error but it is the code that becomes the heart of the website and develops its interactivity.

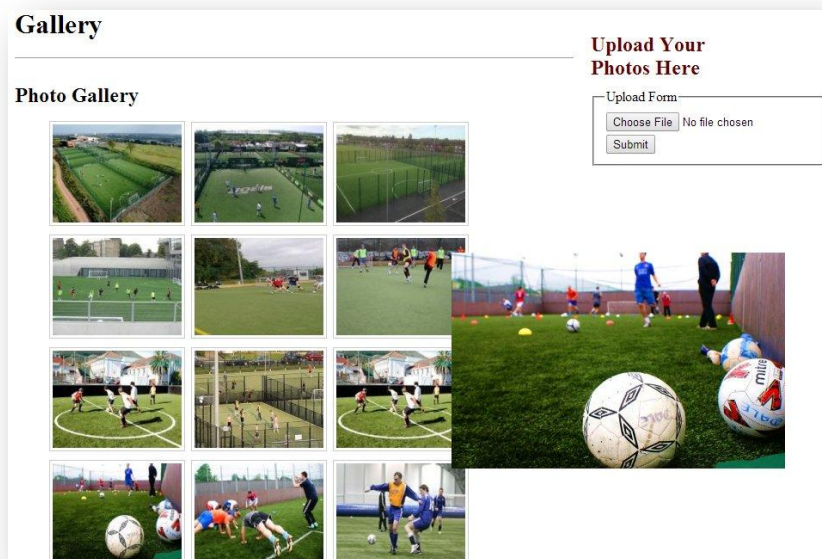


Figure 7 Photo galley thumbnails

## Technology Issues

The web pages were designed in Dreamweaver which gives feedback in coding and syntax errors. Microsoft Expression gives a clearer visual of the errors making them easier to isolate. When introducing dynamic content you have to part ways with both Dreamweaver and Expression. Dreamweaver has a very simplified form creation process in design view but field names, form action and value input has to be carefully edited in code view to correspond with database values and the php file to process the form (figure 8). PHP (recursive acronym for *PHP: Hypertext Preprocessor*) “is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML”

(ThePHPGroup, 2014). Php programs interface with SQL Server database engines and manage the creation of databases and tables, and “manage access rights” (Holloi, A. 2011). Sorting out a process php script that will store the form data in a database is a case of exploring different sets of code and editing them accordingly. Error reporting lines are essential in the script to give feedback on where the script is conflicting. This poses an extra problem in dealing with checkbox data from the Dreamweaver form as they have to be converted to arrays to allow multiple entries to be stored in the database (Kumar, V. April 2012). This problem hasn’t been properly resolved yet but the solution of converting this part of the form to text entries would diminish the databases functionality and the forms simplicity. To simplify the data handling the Dreamweaver database extension needs to be purchased so that Dreamweaver can integrate with MySQL. This extension wasn’t available to be installed from the extensions folder but a ‘form to database’ extension from Dreamweaver can be now purchased (Hot Dreamweaver). This will be the medium term resolution if coding can’t resolve it.

```
error_reporting(-1);
error_reporting(E_ALL ^ E_STRICT);
$family_name=$_POST['family_name'];
$first_name=$_POST['first_name'];
$email=$_POST['email'];
$mobile=$_POST['mobile'];
$area=$_POST['area'];
$days_available=$_POST['days_available'];
$time=$_POST['time'];
$competency=$_POST['competency'];
$field_position=$_POST['field_position'];
mysql_connect("localhost", "r561250_rat", "team_vermin") or die ("could not connect to mysql");
mysql_select_db("r561250_player_details") or die ("no database");
mysql_query("INSERT INTO `Player_Database` (family_name, first_name, email, mobile, area, days_available, time, competency,
field_position) VALUES ('$family_name', '$first_name', '$email', '$mobile', '$area', '$days_available', '$time', '$competency',
'$field_position')");

header( "Location: http://www.rat.ie/successful.html" );
?>
```

Figure 8 php code to connect to msql database and process the data

The Hosting Ireland control panel with the phpMyAdmin interface simplifies the creation and editing of databases. However the process of coding the insertion of the form data into the database is intricate with extensive error possibilities. The process of debugging syntax and coding errors clarifies the functions and sequencing of php coding and gives you the ‘nuts and bolts’ understanding of web design (figure 8). The next stage of understanding would involve databases as Content Management Systems (CMS) feeding into webpage documents and images so that each user of the site experiences a different interface.

## **Site Evaluation**

Users who have accessed the site have confirmed the anecdotal evidence that there is a market for this service among young workers who want to play team games in the evening after work. They confirm the view that it is difficult to find players, form teams or join leagues unless you have grown up in the Dublin region knowing and utilising the infrastructures in existence. As the site is still in early development users were informed that their feedback would be appreciated and their entered details would only be to test the functionality of the site. Users were encouraged to suggest improvements. On the basis of the feedback some immediate changes were made to the site but some issues will have to be left to later phases of the site development.

An important issue that emerged was data security. As a result of that input the site now clearly states that individual’s data will not be used for any other purpose only the completion and creation of teams. Personal data will not be shared with any other organisation and misuse of data by any member would result in their removal from the database. To secure data properly users who enter data should receive an automatically activated password which would limit access to the database to subscribers. However this would limit the ease and accessibility of the site and its quick functionality. Serious thought needs to be given to encryption, security, storage, and removal of user data. “A cross functional team is critical to adequately maintain security and privacy”. (Brett, T, April 2014).

An important issue raised is a lack of clarity on the method to be used in team building: would it be user operated or administratively organised. So that the site doesn’t become too restrictive a dual approach will be adopted: users can access the database to find players or create teams and teams and leagues can be administratively created and organised. In this

way the website can evolve to needs and demands of the users. The overall functioning of the site will be judged on its capacity to give feedback quickly. A “find a player/team now” feature of the site would have to be included in the next phase of development to maximize user usage and website usefulness.

Due to interest shown by users in the concept of the website the problems discussed need to be sorted quickly so that the database can be up and running. To accomplish this I think it will be necessary to get professional advice in the short term to improve the clunkier aspects of the site and improve integration through more advanced programming. For this project I have kept the coding within my own knowledge base and understanding but the development of the site has shown me the necessity of the input of a team of expertise who would give an overall completion to the concept.

## **Reflection**

Designing and executing a website is a challenging and painstaking process. It requires dedication and perseverance but is ultimately fulfilling as each stage has an end product. There is a huge learning curve in website design as many different fields intermix; overall design, graphic design, html coding, php coding, data basing, cascading style sheets and JavaScript. The benefit of the project was in the process and having a focused objective in learning new skills to solve practical problems with the site. It was hugely beneficial as an intense period of debugging and programming. Learning new concepts becomes essential in solving practical website building problems. One of the most constructive aspects of the project was the realization that understanding the coding is essential. Even though Dreamweaver simplifies many aspects of web design it's at the code rather than the design level essential changes have to be made to have a properly functioning site.

The end product is still amateurish and lacks the overall feel and style of a modern ‘cutting-edge’ product ready for business that immediately asserts authority, reliability and trustworthiness. This is not surprising given the restraints on my expertise. However it suggests a roadmap of skills that are required to develop a ‘state of the art’ website. To give the website a current, dynamic feel I embedded Twitter feeds, sports feeds and chat boxes but this is far from ideal as all input should be internal to the site and not direct attention away from the site. All chat boxes and feeds should be unique to the site and all elements should be

aimed to fulfil the sites objective to build a membership database. This site [www.rat.ie](http://www.rat.ie) is still not refined enough to launch and advertise as a finished product ready to do business. It clarifies for me the importance of web design in building a business product and how it would need a team of expertise to maximize its potential and guarantee success from the onset; content managers, graphics designers, coding experts and artistic directors.



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## Appendix A

### Website Server:

Web Site Address: www.rat.ie

Ftp server: ftp.rat.ie

Control Panel URL: http://cpanel.rat.ie/

For ftp and control panel access

Username: r561250

Password: y76E4Rohf1

*\*All file for www.rat.ie are stored in the following folder once you login through the control panel:\**

***ftp://ftp.rat.ie/public\_html/***

*\*Some folders are for future reference: querying the database etc\**

### MySQL Database:

Mysql database

r561250\_player\_details

user r561250\_rat

password team\_vermin

### Images:

datatabase2 r561250\_images

user r561250\_images

password team\_vermin