

The Western Indian Ocean - Invasive Species Practitioners Network

Bachelor of Technology

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End of Year Report

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Abstract

In the present day, internet connectivity is essential for all kinds of tasks within an organization mainly because it facilitates the swift and easy retrieval of information. People all over the world can effortlessly communicate, share information and work together. Not many people go to a library any longer for there are online library systems and many of these online libraries have resources that can be viewed online. This paper outlines a project which comprises the development of an online bibliography system and skills register for the easy retrieval of data. These two will be integrated on a website for the Invasive Species Specialist Group. The paper is a walkthrough of the progress in the development of the project and the consequential outcome to date.

1. Introduction

The Bachelor of Technology degree at the University of Auckland consists of four years, the fourth year is an honors year where students carry out a project to reflect the skills and knowledge they have gained throughout their course. My fourth year project is carried out with the Invasive Species Specialist Group (ISSG) under the management of Ms. Shyama Pagad, a manager at the ISSG. Acronym is an IT Company founded by Chris Craig; Acronym usually takes on development projects for ISSG and therefore offered to support and mentor me through the course of this project.

1.1. The Company

The Invasive Species Specialist Group (ISSG) of the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN) specializes in invasive species, which are animals, plants or other organisms that are dangerous to the environment. When species are introduced into a new environment or geographical region that is out of the range of their natural distribution, their numbers rapidly increase and disperse causing what is commonly termed as Biological Invasion. Sometimes the introduced species generate a negative impact on the local ecosystem and on the other species within the area. Invasive species can have a harmful effect on human health, the economy and the native ecosystems. Practitioners working with invasive species attempt to prevent harmful effects and communicate their practices and knowledge. ISSG is a global network of practitioners that aim to raise awareness of the impacts of invasive species on native biodiversity and natural areas, and of ways to prevent their introduction, manage and control their spread. They do this through three main areas of activity, 1) the giving of policy and technical advice; 2) providing stakeholders' access to information and 3) facilitating information exchange through promoting networks.

1.2. The Problem

Biological invasions are acknowledged as a key driver of biodiversity loss, especially on island ecosystems which are hotspots of biodiversity. Island groups require a means of getting information on how to prevent biodiversity loss but the limited capacity and access to information are identified as barriers to effective management of invasive species on the islands. The ISSG expects to promote and facilitate access to information, exchange of information, knowledge, experiences and best practice through invasive species practitioner networks on island groups such as the Western Indian Ocean Islands, the Caribbean and the Pacific.

The ISSG requires a means by which practitioners and specialists in the Western Indian Ocean Islands can communicate, share information and contact specialists if the information available is not enough.

With contacts in the Western Indian Ocean Islands, communication becomes a challenge, firstly because of the distance and another due to the language barrier. As mentioned above ISSG's main activities involve networking, information exchange and giving technical and policy advice and these challenges that the group faces directly affects their activities. ISSG therefore has to overcome these issues to carry out their aim without difficulty.

1.3. Solution

The Western Indian Ocean - Invasive Species Practitioner's Network (WIO-ISP) is a website that facilitates communication and sharing of information regarding invasive species. With the internet so widely used in the present day, it removes the boundaries between countries and enables fast and easy communication. The website will therefore provide practitioners and specialists in the Western Indian Ocean Islands a space for storage and access to relevant documents, a space for exchange of experiences, lessons learned, research and innovation with invasive species specialists all over the world.

1.4. The Project Scope

The scope of the project is to create the Western Indian Ocean Invasive Practitioners Network (WIO-IPN) website that will offer a means by which individuals can search for information on invasive species, this information may include possible methods to prevent their introduction into the environment and ways to control and eradicate them. The website also provides a communication mechanism by which people can take part in discussions and get their questions answered. Also, the website assists the discovery of various specialists with skills in the field that people may like to contact.

The main viewers of the website are likely to be ISSG members, invasive species practitioners on the island groups, conservation managers, protected area managers, species experts,

customs and quarantine officials, officials from Government Environment and other related departments such as fisheries, forests and agriculture, researchers, allied industry persons such as from the aquaculture industry, nursery trade, pet trade etc.

The website should have the potential to promote the ISSG and enable it to carry out its activities of information exchange, networking and providing policy and technical advice.

1. The site contains a bibliography database that allows users to search for or submit resources such as articles, journals, books and more on the subject of invasive species.
2. The site has a skills register for users to search for invasive species experts and if the user are themselves invasive species specialists they can register themselves to the website and this will aid others to find and contact them.
3. The site comprises a blog that will be a means by which the organization (ISSG) can communicate interesting information like newscasts or the discovery of a new invasive species, the kind of information that will stimulate discussions and that will attract and interest the viewers of the site.
4. The site needs to be user friendly so that users around the globe can navigate through the web pages and carry out their tasks without difficulty.
5. The site will also be required to overcome the language barrier between countries through the use of a translator tool.
6. A live chat facility is needed for conference calls and easy visual communications that will overcome the distance barrier between countries when an important issue needs to be conversed.
7. A photo gallery that will enable users to upload images they have taken of any species.

1.5. Project Objectives

1. To implement a user-friendly web site that enables users to look up an invasive species specialist or information on various invasive species.
2. To support efficient communication between networks of practitioners across the globe.
3. To provide effective navigation, usability, accessibility, and functionality.

2. Tool

Development began around midyear, when the decision was made that the content management system (CMS) tool, Umbraco would be used. Before this decision was made other tools were being considered, like MS. SharePoint Server, Drupal and Dotnetnuke.

2.1. Why Umbraco?

Umbraco is an open source tool, it is easy to use, it has multi-user support and it uses a SQL Server database and XSLT, it follows XML standards and can be used with languages such as RAZOR and ASP.NET and since I have knowledge and experience with ASP.NET it is the ideal tool.

Advantages of using Umbraco:

Benefits	Reason
Flexible	With Umbraco, developers can build all sorts of websites eg. It has starter kits for Blogs, simple business starter kits and more
Easy to Learn	To use Umbraco, one does not require training or technical skills, it is simple and easy to work with
Open Source	It is free, which is beneficial for ISSG
Separation of design and content	It is easy to change the style of the site without tampering with the content
Hierarchical Content Structure	Content is logically arranged in a branched folder structure, making it easy to manage as will be seen later in this paper
Permissions	Many different user types can be created with different assigned permissions

Umbraco vs. Drupal

- As a developer I prefer using .Net over PHP
- Although ISSG's requirements for this website are simple and common functionalities that are required by many other businesses and Drupal has a pre-made module for the main functionalities of this site, Umbraco is more flexible and changes/updates, additions and deletions can easily be made to the interface and the code behind the different areas of the site [5].
- Drupal is not as user friendly as Umbraco and in comparison to Umbraco has a much higher difficulty level.

Umbraco vs. MS. SharePoint Server

- At first SharePoint's high licensing costs was an issue because ISSG is a non-profit organization but then the university provided the tool and the server space however they

would not allow Acronym the development company access so another tool had to be considered and Acronym decided to provide the server space.

- From reading through many blogs on CMS's, it was suggested that SharePoint is more suitable for intranets than for public websites.
- For SharePoint the administration of the website will require extensive staff training and high maintenance costs, it may not be suitable for the long run of small companies.

Umbraco vs. Dotnetnuke

- Compared to Dotnetnuke, Umbraco is more flexible in design and interface.
- There are many versions of Dotnetnuke and upgrading to newer versions may be a challenge, with Umbraco upgrading to new versions is easier.

Umbraco can be used with Microsoft WebMatrix, a free, development application that allows the use of popular open source applications to build websites with ASP.NET, PHP, HTML, Razor and more. Umbraco provides a selection of starter kits, such as business, normal and blog starter kits. I began development using the blog starter kit; since the blog was in-built it only had to be configured and the other required functionalities could just be added on. However, starting development with WebMatrix was not a good idea because this creates the website on the local machine and the website had to be up on Acronym's server. The first meeting with the mentors at Acronym involved an update on the work that I had done so far and to decide on the next step. The next meeting involved setting up a new Umbraco site and creating the new Umbraco sites folder on Acronym's server. The process of creating the new site also involved connecting to an MS SQL Express database. The work that I had done so far, such as login and registration, layouts, template, pages, images, document types, were all packaged and added to the new site.

3. The Umbraco Controller

For each site that is setup for development using Umbraco, there is a unique Umbraco controller. The Umbraco controller is the tool; it can be used for both the creation of the site and the maintenance and management of the site. Umbraco has multi user support; more than one person can access this controller. Usually the individual that has access to the controller is likely to be the developer or the websites moderator. The users section on the controller is where user login and access can be setup. The left hand panel on fig 4.0 below shows the users who have access to the backend of the site; my name, "Afshaa" is visible under the "Users" folder indicating that I have access, which I require in order to carry out the development of the site. The right hand side of the image shows a user's editable details such as the login name, password, user type and more.



Fig 3.0-Umbraco Controller Login

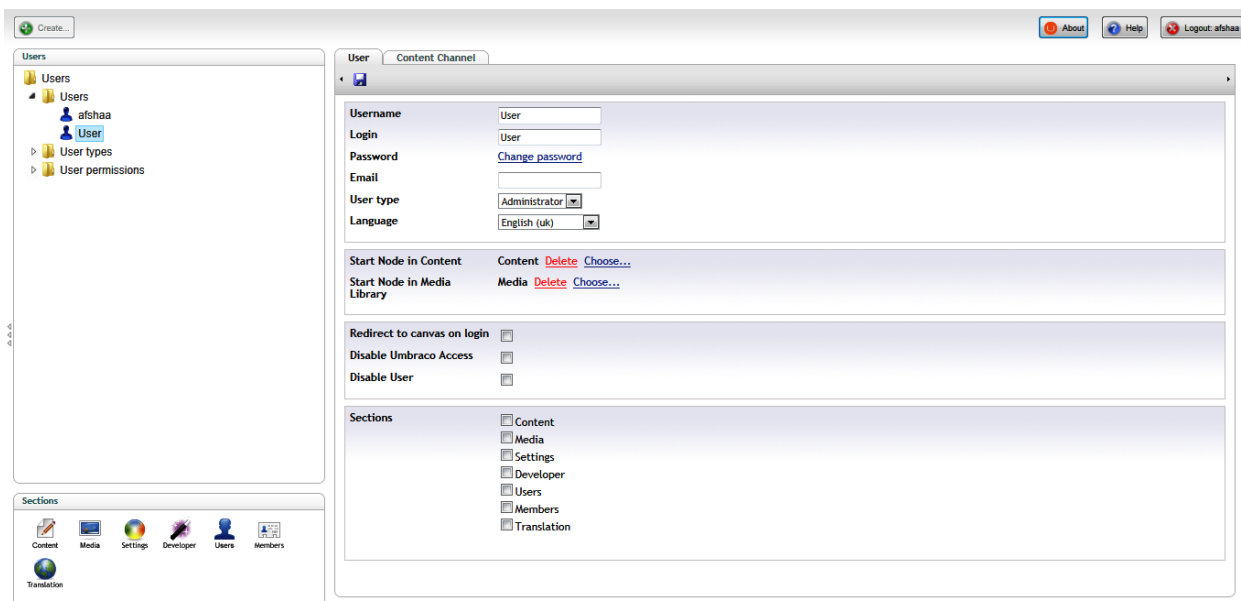


Fig 4.0-The User Section

Organizational users are the individuals that develop and maintain the site; they have access to the backend of the site. There are also users that do not go beyond the interface they only view the frontend of the site; these users are called members. Like organizational users, the members can also be setup and their details are accessible through the Umbraco controller. Since, the only users whose information is required to be stored for communication purposes are invasive species experts who register themselves to the website; an “Expert” member type is created in the member section of the Umbraco controller as shown in fig 5.0 below.

Each expert's details are required to be stored for the sole purpose of allowing the websites viewers to search for and contact them. These details are setup under the generic properties tab in the Umbraco controller, the site moderator can edit these properties as shown by fig 6.0 where there is a drop-down option and a red cross by each property under the generic properties tab. Also using the "Tabs" tab (Fig 7.0), the moderator can add another tab besides generic properties and add properties to it and this too will appear in the users profile on the website. These details can also be retrieved and edited by the expert themselves on their website profile.

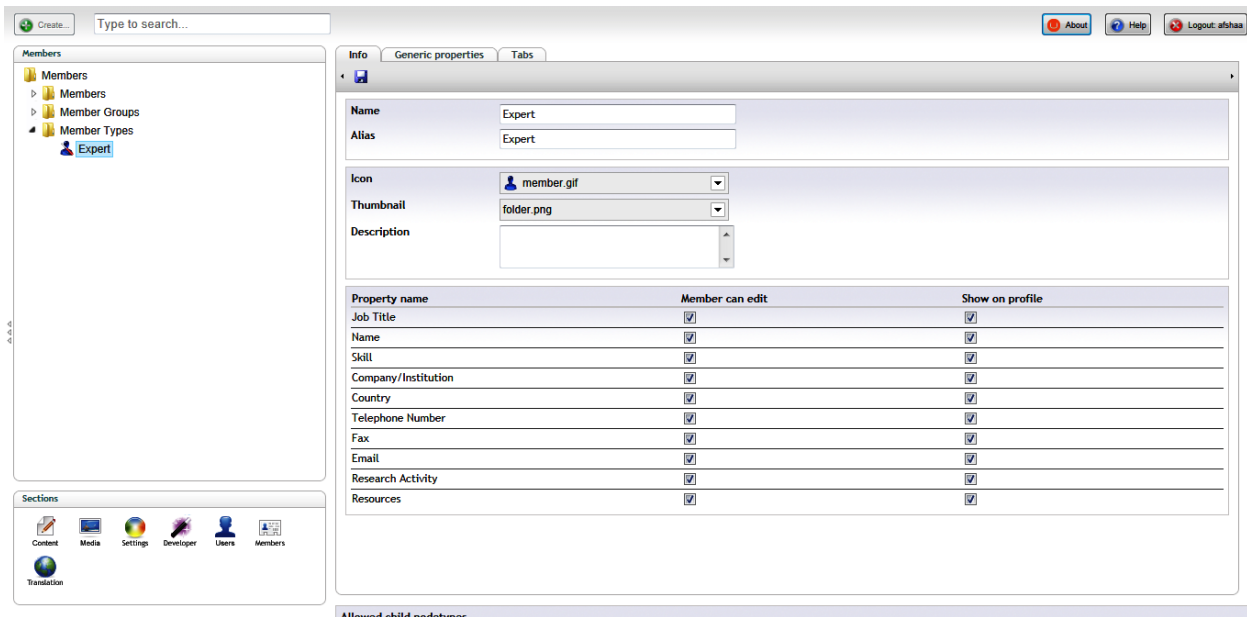


Fig 5.0-The Members Section

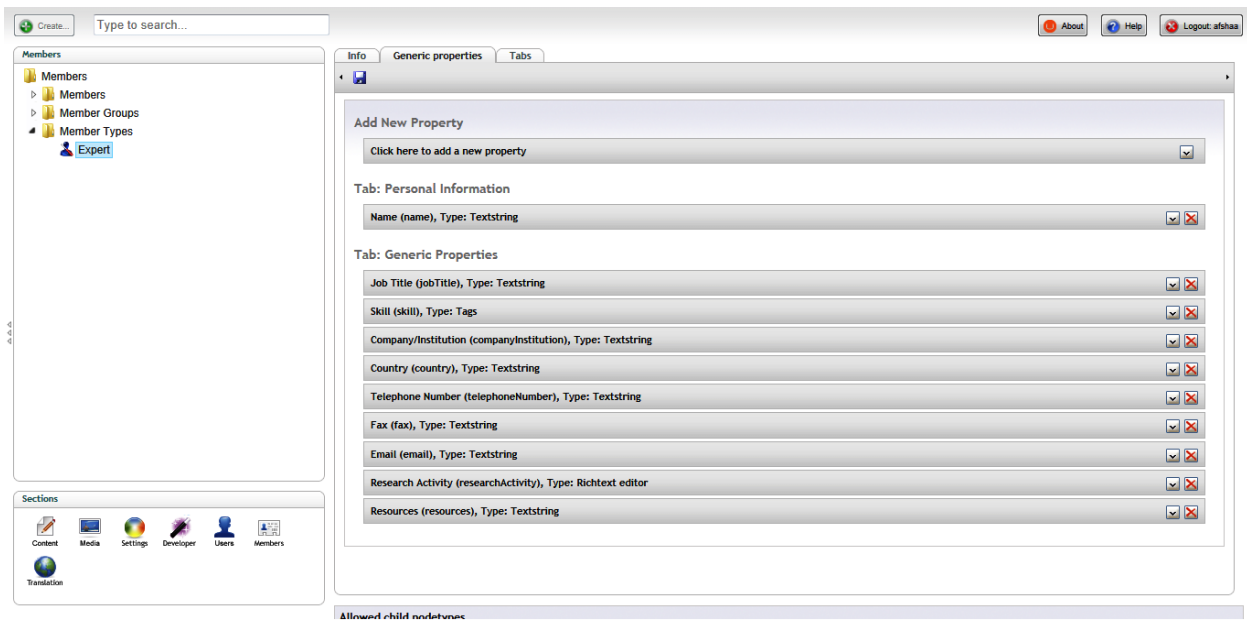


Fig 6.0-Generic Properties in the Members section

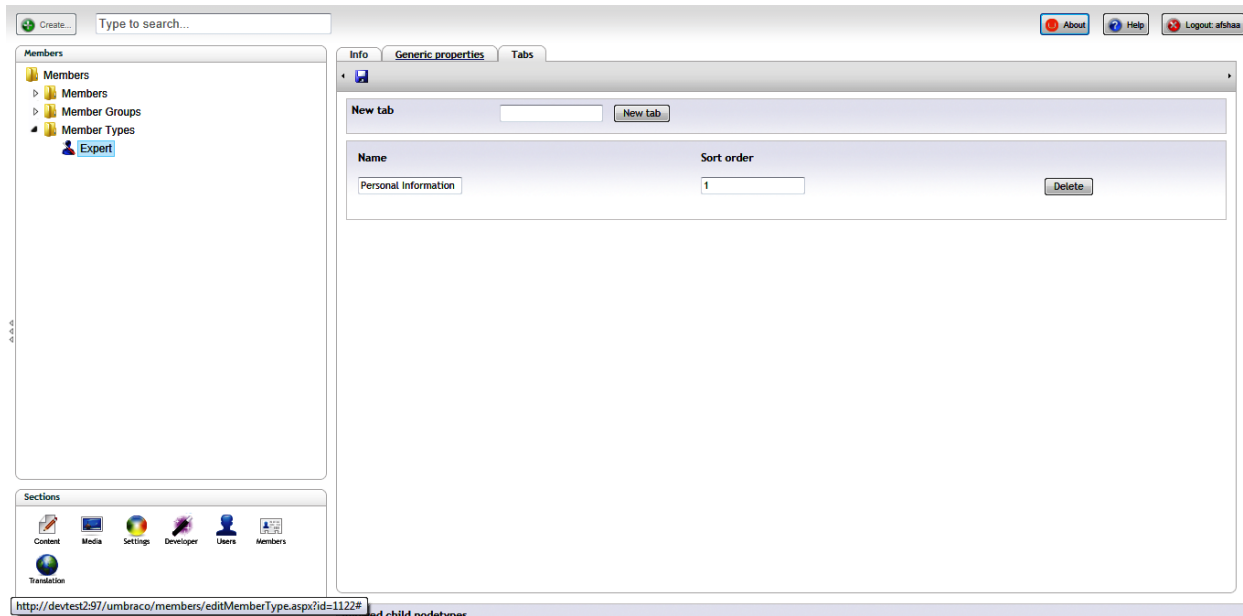


Fig 7.0-Tabs in the Members section

3.1. Development Steps

1. Generated a Microsoft visual studio, ASP.NET Web Application for the creation of user controls. User controls for each of the mandatory functionalities were created. User Controls or .Net Controls are ascx files as presented below.

```

  > EditBibliography.ascx
  > Extensions.cs
  > MemberProfileEditor.ascx
  > MemberSearch.ascx
  > MemberWithProperties.cs
  > packages.config
  > ProfileEditor.ascx
  > Register.ascx
  > Registry.aspx
  > SearchBibliography.ascx
  > Web.config
  
```

Fig 8.0-User Controls Created in Visual Studio

2. Once the interface for the user control and the code behind it is complete, it is added to the Umbraco sites folder on the server.
3. On Umbraco I created a new macro in the “Developer” section. Macros are small building blocks of functionality, and this functionality is to meet the requirements to carry out a specific task. Fig 9.0 shows the Developer section on Umbraco where a macro is created for a user control called “Register”.

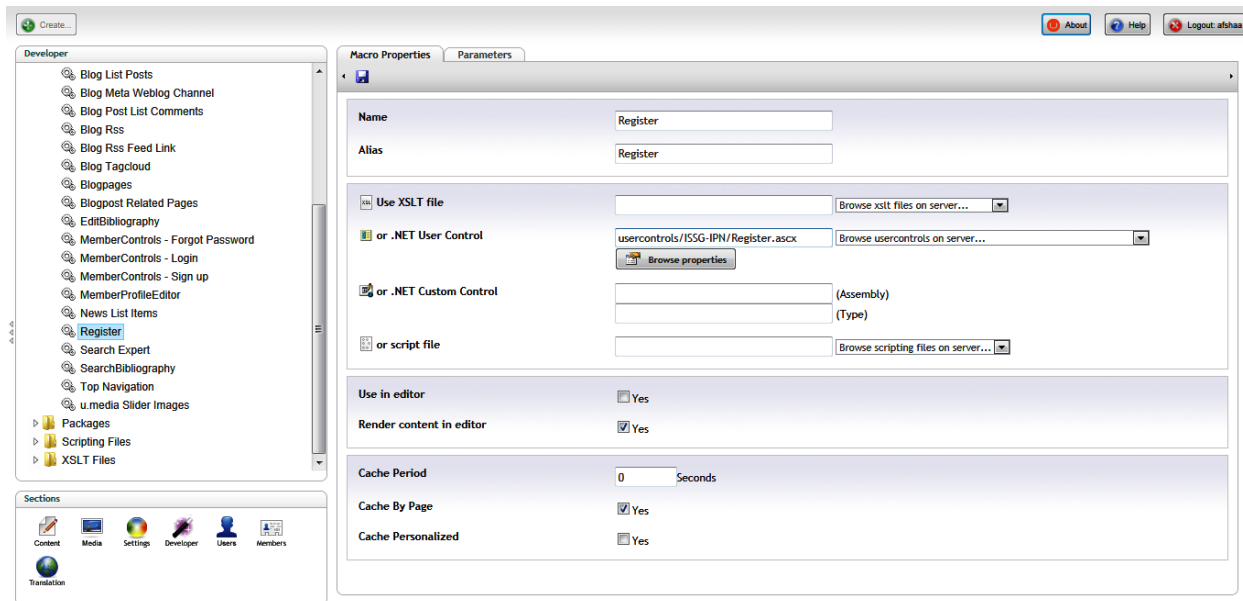


Fig 9.0-Creating a macro

4. These macros are then added to templates created in the “Settings” section.

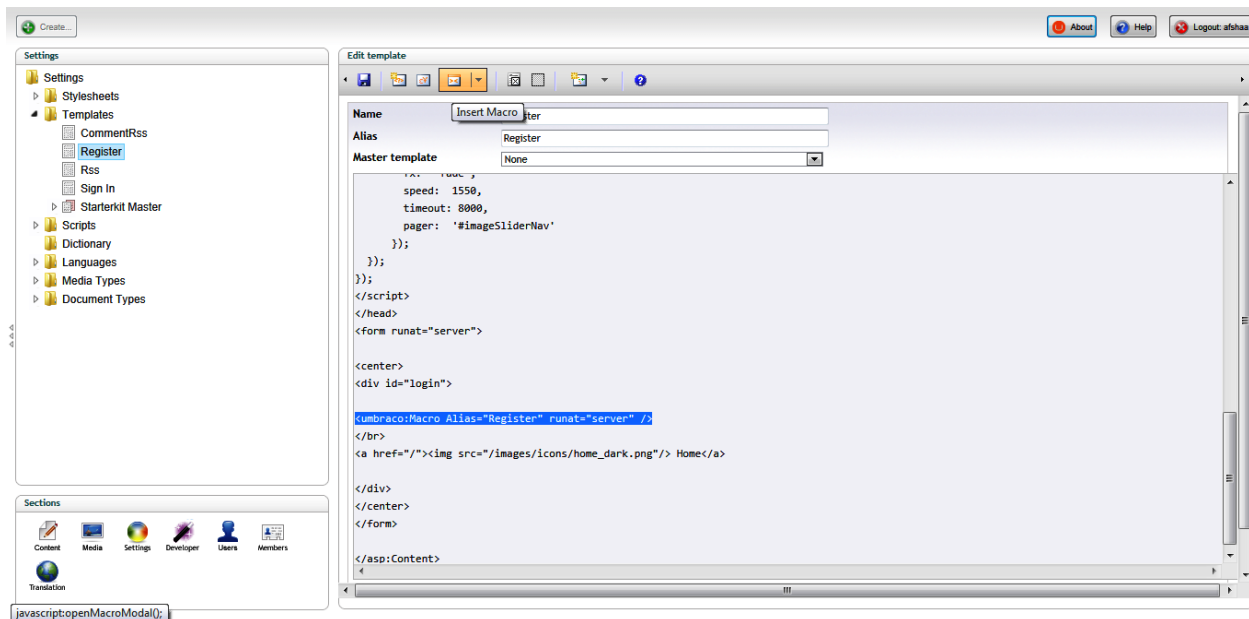


Fig 10.0-Inserting the macro into a template

5. In the “Contents” section the pages are created using these templates.

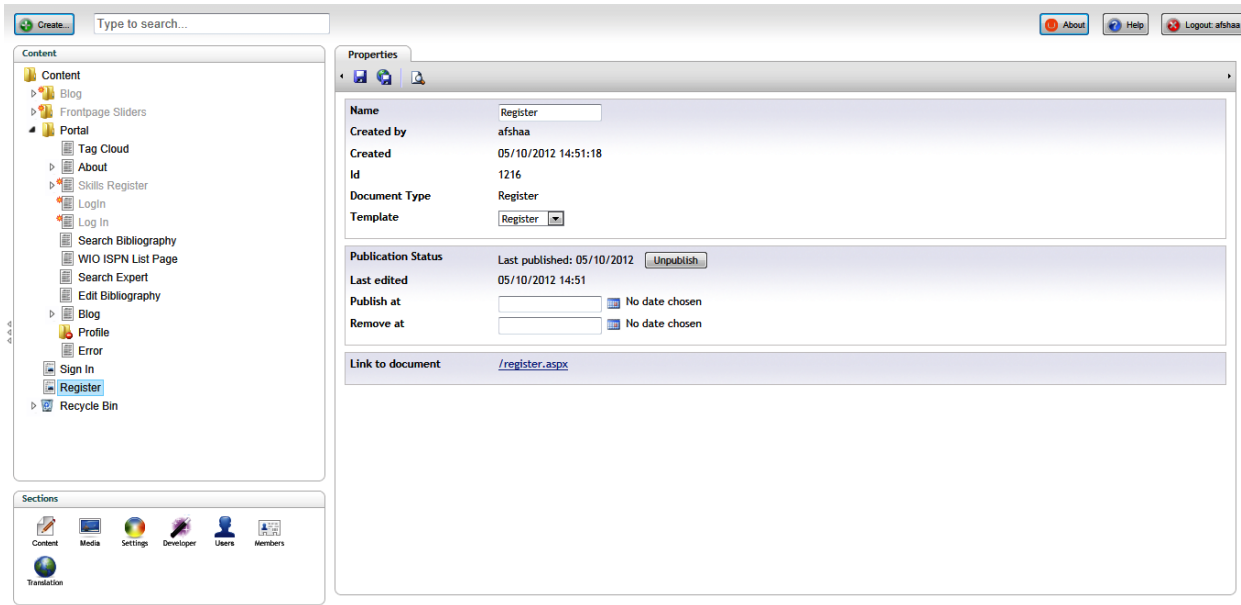


Fig 11.0-Page created with the template into which the macro was added

4. Database

The database used for this website is a Microsoft SQL Express database and the website uses it primarily for the storage and retrieval of expert's details and the resources details. These "resources" are articles, journals and more on the matter of invasive species and are typically accessed via a link on this website. Tables in the database are automatically created when a new "Member Type" or other new data is created in the Umbraco Controller. The tables involved in the functionality of this site are the:

1. The "Bibliography" table contains all the details for each resource, such as the title, author and more. These resources are online articles, journals and more that the user of this site can navigate to or access via a link (reference).
2. The "Member" table, "Member Type" table, "Property Data" table and more for the search and entry of and Invasive species expert and their information such as their contact details and skills.

MS SQL Server and Umbraco work well together, there was no need to spend time thinking about the design of the database and connection information and creating queries.

The database is a new and there are currently no information or resources entries on it but example data was added for testing purposes while implementing. Both connection strings and data access layers (DAL) are used to store and retrieve the data. A DAL is a layer of a computer program that allows the easy and simple access of data in the database. In the visual studio project the DAL is setup, there is a DAL folder and in the folder there is an entry to setup a

connection string. Through the use of the DAL the user can also specify what tables from the database are not required to be accessed; this speed up the search and retrieval due to only a few tables being accessed via the DAL.

In the Web.Config file in the visual studio project the Connection string is setup:

```
const string Namespace = "ISSG.IPN.DAL";
const string ConnectionStringName = "IPN";
```

Fig 1.0-Web.Config Connection String Tag

Data Access Layer Background Information

There are three layers, the data layer, the business layer and the presentation layer [13].

1. The presentation tier- the user interface and the code behind it. In the case of this project the presentation layer is the code behind ASP.NET pages and user controls.
2. The business tier- the most important tier which contains the data access layer, the business layer maintains the business processes which in the case of this websites is simple data search and entry. The data access layer separates the data access logic (which are the methods needed to access the data from the database) from the business objects (which are the business processes). Method calls are used when business objects need to access data logic. Fig 2.0 is a diagram on the three layers:

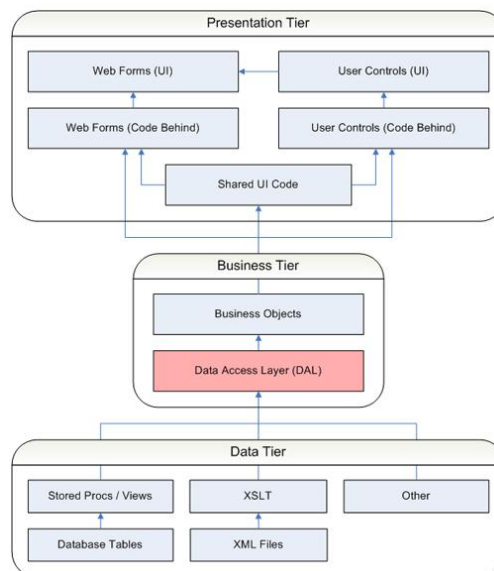
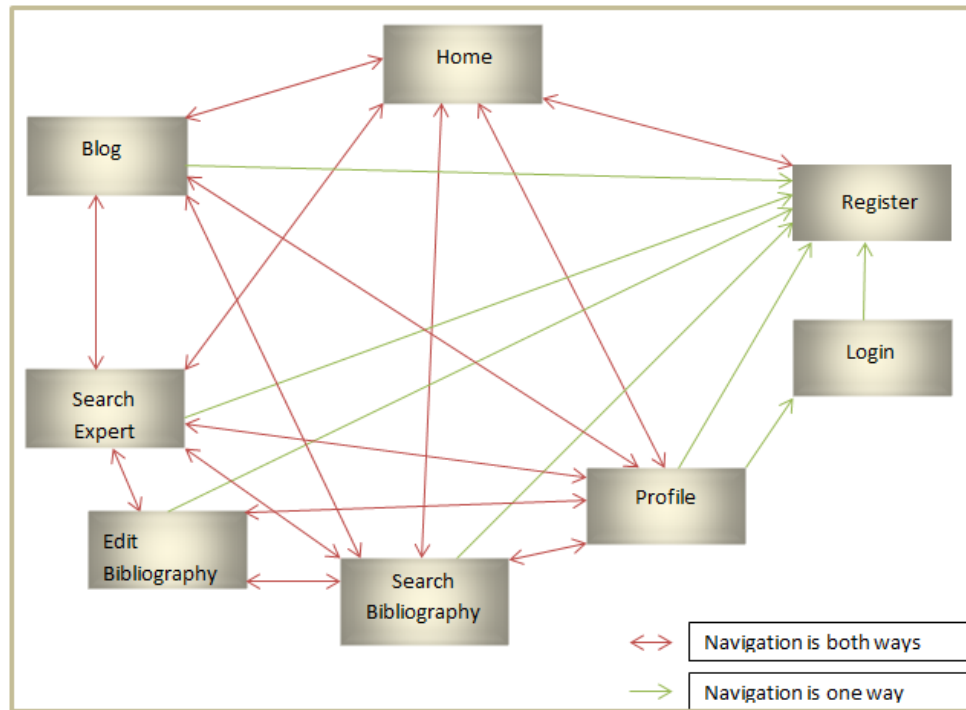


Fig 2.0-Design Layers [13]

3. The data tier- manages the physical storage and retrieval of data.

5. The Website Flow Diagram



The layout of the website is simple and navigation is easy. It is definitely user friendly and can easily and readily access all functionalities.

6. Data Management and Site Maintenance

Through the use of Umbraco the data can be easily managed and the site maintenance does not require as much effort. It is necessary to ensure that the site remains current, though it was mentioned that bibliography entries are rarely removed, once they are on they stay on. However, an expert's information needs to be kept up to date; this can be maintained by the site moderator using the Umbraco control or even the expert themselves through the front end of the site.

7. Interface Design, Implementation, Problems/Improvements and Possible Solutions

7.1. Home Page



Fig 12.0-Top of the Home page

The Invasive Species Specialist Group (ISSG) is part of the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN), all three of their logos have been added to the top of the page, and they are all navigational to their corresponding sites. The logos, the title, the register link, the menu bar and the footer is part of the master template and will therefore be viewed on every page the user navigates to from the menu bar. The content of the home page is exclusively for the advertisement of the different invasive species that exist in the world. The large image on the left is a slideshow of invasive species and beneath the slideshow is a description of each of the images that the slideshow makes its way through, for now this has not been added and contains default text. On the right there are links to sites that showcase the “Invasive Species of the Week” and “Amazing Species”. The “register” hyperlink at the top right takes the user to a page where they can register themselves as invasive species professionals to the website.

The footer contains navigation so that the user can redirect to the other tabs from the bottom of the page without scrolling up to the menu bar. Under the heading “Share/Social”, are links to sites that relate to the website such as ISSG’s Facebook page. Under the “Contact Information” heading, exists the particulars of an individual who can be e-mailed if any information regarding

the site is required. The fourth and last column in the footer has yet to be edited, for extra information is required and it will not be an “About” column.

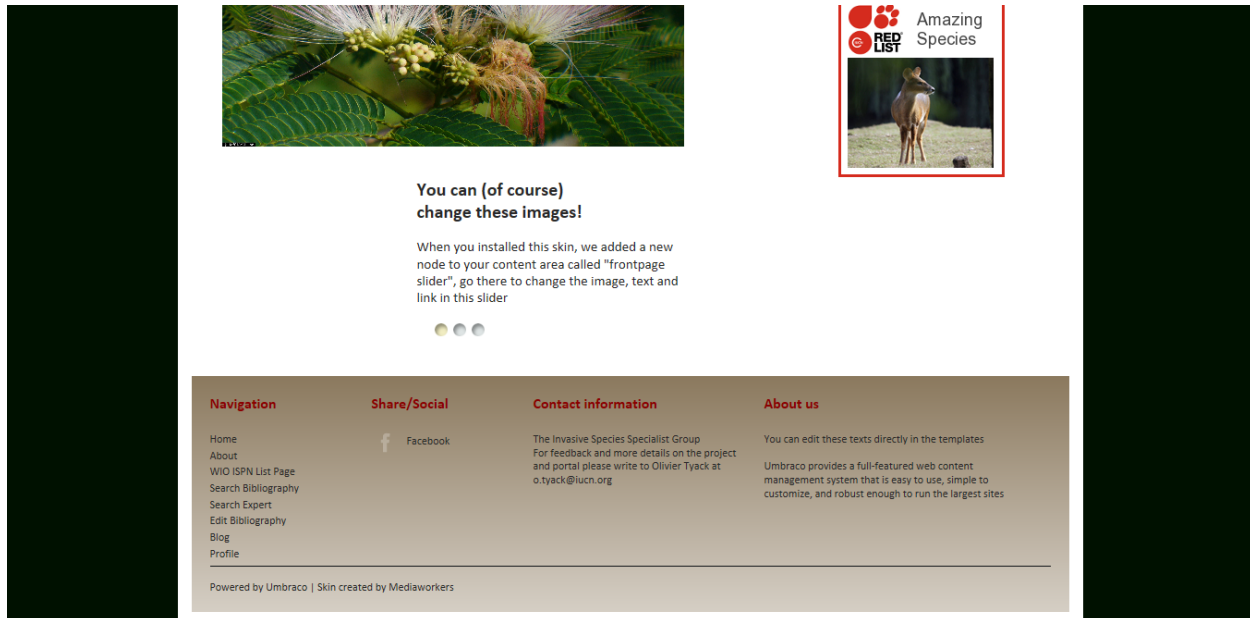


Fig 13.0-Bottom of the Home page

7.2. About

The “About” page consists of information on what the site is about and what it can be used for, in both English and French.



Fig 14.0-About page

Improvements

Rather than having the text in English and then followed by the text in French, it would be more efficient to add a drop down box selection of languages that the user would prefer the text to be in, this will also use the space wisely. This improvement is part of the future work that involves the addition of a language translator to the site.

7.3. List Service

On the “WIO ISPN List Page” the user can subscribe to receive information and news and exchange information. It’s a means by which to share information or news to groups at a time. It’s like a forum where people can give news, ask questions, and carry out discussions and more. It is also a means by which ISSG can give out policy and technical advice.

Implementation

Simple since a list service site already existed for ISSG, this only included adding information regarding the page and the link to the list service site where users can login or sign up for the service.

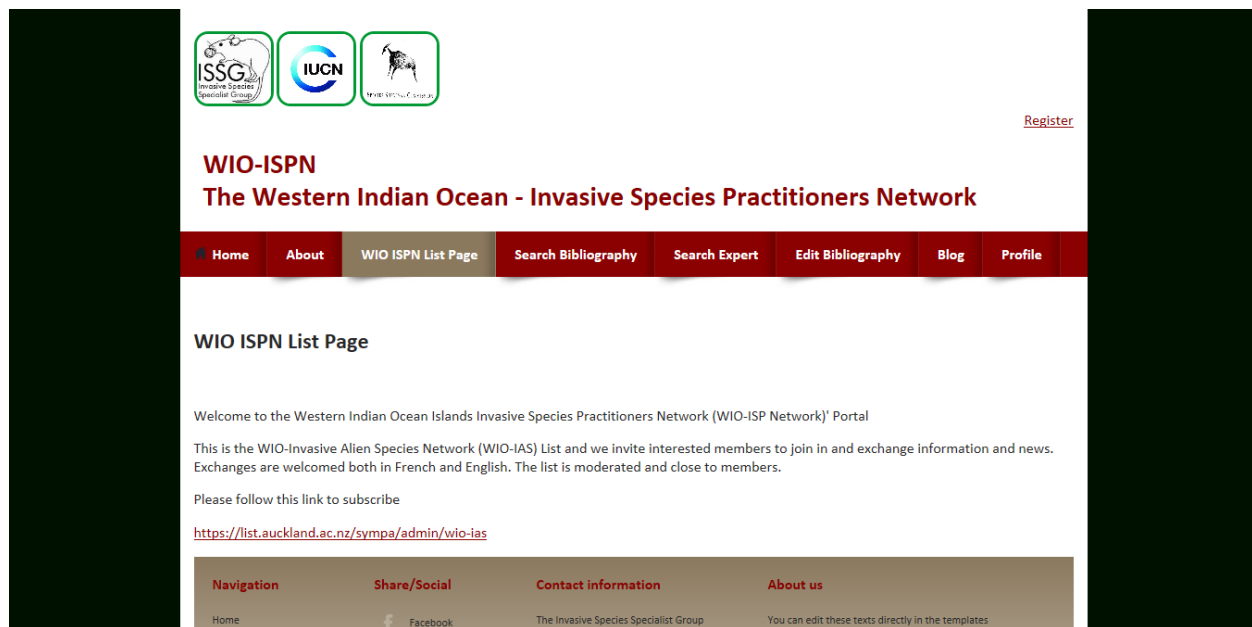


Fig 15.0-List Service page

7.4. Edit Bibliography

Home About WIO ISPN List Page Search Bibliography Search Expert **Edit Bibliography** Blog Profile

Welcome to the Western Indian Ocean Islands Invasive Species Practitioners Network (WIO-ISP Network)' Portal

Resource Entry

Title:*

Author:*

Date Published:

October 2012						
Mo	Tu	We	Th	Fr	Sa	Su
24	25	26	27	28	29	30
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Reference:*

Abstract:

Species:

Created On:

October 2012						
Mo	Tu	We	Th	Fr	Sa	Su
24	25	26	27	28	29	30
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Created By:

Modified On:

October 2012						
Mo	Tu	We	Th	Fr	Sa	Su
24	25	26	27	28	29	30
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Modified By:

Fig 16.0- Insert Resource into system with “Edit Bibliography”

This page contains a fill out form that can be used to submit an entry into the online bibliography system. The form contains three fields that are mandatory and have to be filled out in order for the entry to be successful; these three required entries are the title, author and the reference. The reference is a URL link to an online article, journal etc. on the subject of invasive species that will inform other viewers on the growth, management or eradication of a particular invasive species. Other fields that are required to be filled out are:

- The date of publication,
- An abstract,
- The species that the resource is about or even briefly refers to in the text,

- The date of creation which is usually the date the resource is being entered into the system,
- “Created by” which is the user submitting the resource,
- “Modified on” is the date that any change was made to the resource since its publication and
- Whom it was modified by.

On submission, a notification text appears confirming the successful entry of the resource into the database.

Created By:

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Modified On:

<

October 2012

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Mo

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Su

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31

1

2

3

4

Modified By:

Submit

New Entry

Resource has been successfully added!!

Navigation

Home

About

WIO ISPN List Page

Search Bibliography

Search Expert

Edit Bibliography

Blog

Profile

Share/Social

Facebook

Contact information

The Invasive Species Specialist Group

For feedback and more details on the project and portal please write to Olivier Tyack at o.tyack@iucn.org

About us

You can edit these texts directly in the templates

Umbraco provides a full-featured web content management system that is easy to use, simple to customize, and robust enough to run the largest sites

Powered by Umbraco | Skin created by Mediaworkers

Fig 17.0-Resource has been successfully added

Implementation

The DAL is used to access the bibliography table where all the entries are made. In fig 18.0 below, it is clear that “Bibliography” is accessed via the DAL shown by the hover comment. A variable is created using the tables type, this then used to assign field entries in the form to the corresponding columns in the table.

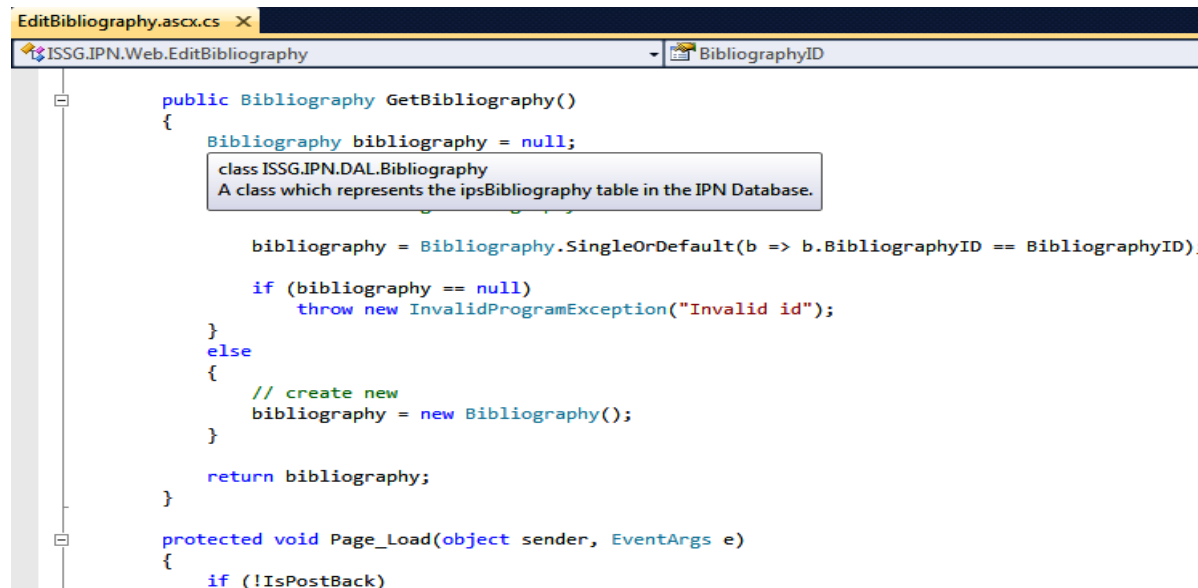


Fig 18.0-Connecting to table “bibliography” in database using DAL

```

private void LoadFromEditor(Bibliography bibliography)
{
    bibliography.Title = TextBox1.Text;
    bibliography.Author = TextBox2.Text;
    bibliography.DatePublished = Calendar1.SelectedDate;
    bibliography.Reference = TextBox4.Text;
    bibliography.Abstract = TextBox5.Text;
    bibliography.Species = TextBox6.Text;
}

```

Fig 19.0-loading textbox entries from the form into the table’s columns

Problems & Solutions

1. For the “Species” field in the form, more than one species can be entered because most article, journal and books are likely to have vital information on more than one species that can be informative to a user. Viewers have no way of knowing that they can enter more than one species into the textbox separated by a comma because there is no description beside the textbox instructing them of this. There is a simple solution of adding descriptions to the “Edit Bibliography” user control and re-adding it to the site.
2. When the “Date Published” is not entered the site navigates to a “403 Error” page, this can be resolved by either an error message or a validation.
3. When the “Created On” and “Modified On” dates are not entered, the current date is automatically added, the reason for this is unknown at the present time. The current date for the “Created On” field works since the entry is meant to be the date on which the user added the resource to the system. However, this can be resolved with additional code in the

“EditBibliography” user control indicating that if it is left empty then it should remain empty. This can be done by adding the following code to the “loadFromEditor” method (Fig 19.0).

```
bibliography.CreatedBy = TextBox8.Text;
bibliography.ModifiedOn = Calendar2.SelectedDate;
bibliography.ModifiedBy = TextBox10.Text;|
```

Fig 20.0-Solution to default entry

4. If the resource being entered was created or published in the 1900’s or before, it would be a challenge and irritating for the user to go back to that year using the arrows on the calendar. A possible solution to this is a manual textbox entry of the date or a drop down selection of the year. A drop down box would be an efficient approach by which to enter the dates because it could also check for when resources modified after a specific year are not allowed to be entered because they could be outdated (say that no resources before the 1700’s are allowed to be submitted then the drop down box will not contain any selections for before that year).
5. A user does not have to be a member to be able to add a resource into the database, therefore currently there is no means by which to check that the user is trustworthy and will enter a resource that is on the subject of invasive species. An improvement can be made through the use of a notification email being sent to the moderator on the submission of a new resource which they can then check. Another solution is to have users be members in order to make a submission.

5.5. Search Engines

With information being added on the World Wide Web every day, there is a need for structure and coherence so as to enable users to find exactly what they are searching for and more. The search engines implemented in this website is not as efficient and precise as it should be. The searches are currently based on a single keyword search and in the case of the “Search Bibliography” users have to enter the exact title with the correct spelling into the search engine, or else there will be no results. The use of a semantic web search engine can overcome the issue with spelling errors by the user because the semantic web aims to understand the meaning of the term entered into the search data space.

The need for a semantic web can be proven in an example where a user enters the word “jaguar” into the search engine and results for both the car and the animal jaguar appear. Now how does the machine know which jaguar the human is looking for? The semantic web therefore enables the machine to understand the word by transforming it into machine readable text. Many semantic web search engines are being developed due to the high reliance on the internet for information, “Search on the Semantic” [3] describes a semantic web search engine known as “Swoogle”, it finds, analyzes and indexes information found in online documents so as to aid human users in finding what they are looking for.

5.5.1. Search Bibliography

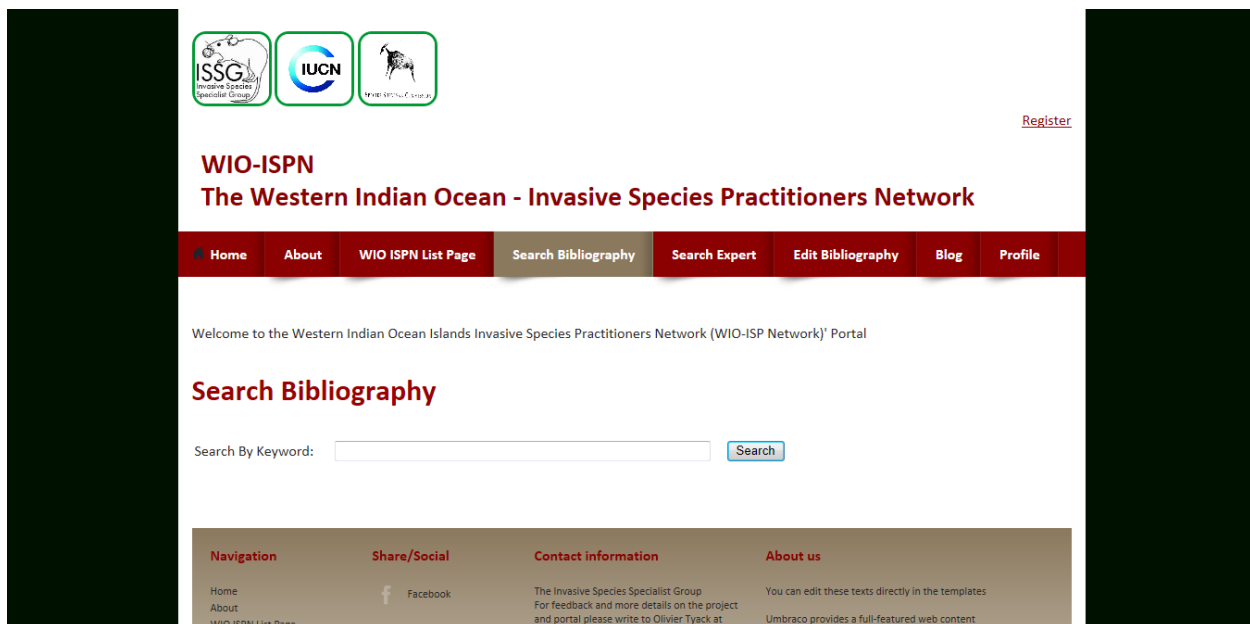


Fig 21.0-Search for a resource using “Search Bibliography”

The user can enter a title into the textbox and search for articles, journals and more on the topic of invasive species. On clicking the search button, results are displayed in a form view as seen in fig 18.0. All the information that was entered on the submission of the resource is visible to the user under the search results. On clicking the hyperlink under reference the user is redirected to the resource.

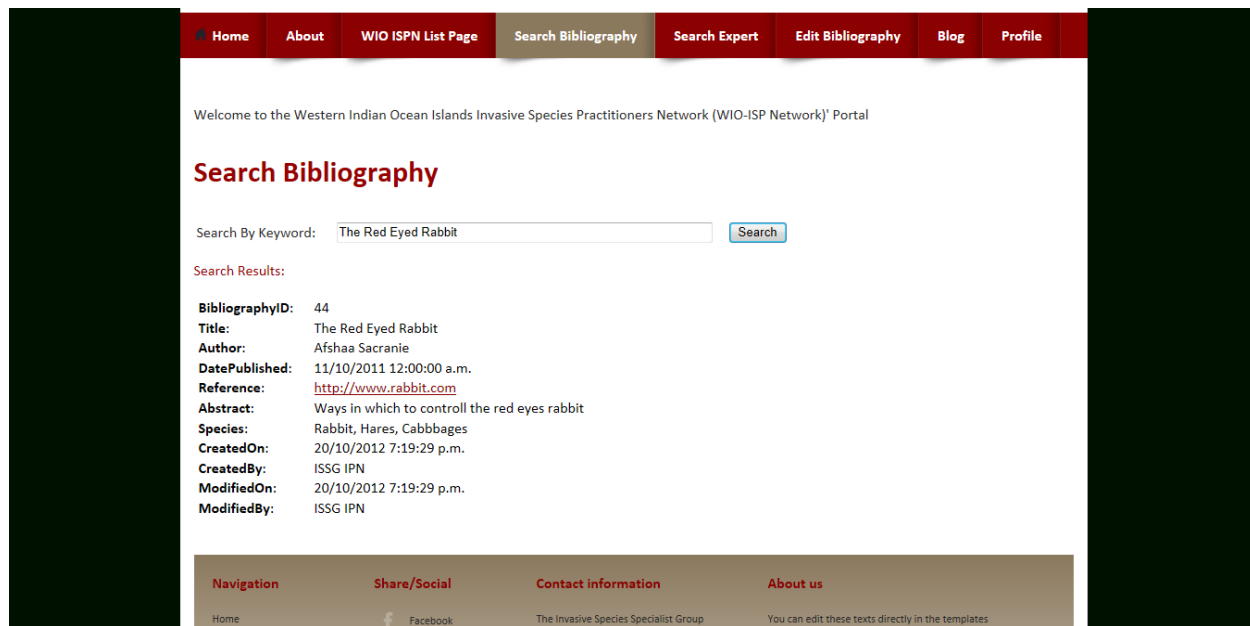


Fig 22.0-Search Results on searching for a resource

Implementation

```
SqlDataSource1.ConnectionString = ConfigurationManager.AppSettings["umbracoDbDSN"];
```

The search for a resource in the database is simple because it involves on a single table, the bibliography table and so a simple connections string was used to connect to the database.

Problems & Solutions

1. When details are not entered for a resource on submission these details auto fill and still appear under the search results and this is wrong, this should not be happening and the unfilled details should not appear.
2. The search should be based on a key word and should not rely on the title name being filled out in the search textbox.

```
var data = Bibliography.All().Where(b => b.Title.Contains(keyword)).Paged(pageNumber, pageSize);
```

This problem occurs because “data” is not being used anywhere. It is a simple coding error and can be easily fixed so that the query will allow a single keyword to be entered into the search textbox and will result in a resource with that key word in the title. Even after this fix the search engine is not as exact because users should be able to search by typing in species names as well and so the query should include:

“OR b.Species.Contains(keyword)”

3. The search engine requires more criteria such as entering the type of the resource. A drop down selection for the type of resources can be added as shown in fig 23.0 below.

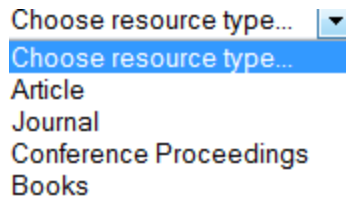


Fig 23.0-search criteria for resource type

It is crucial for the search engine to look for words in the resources that match the keywords entered in the search data space. Google does this and usually the words that match the keyword in the document are highlighted in bold in the search results [8]. These words are called Meta tags; they are placed in the header of an HTML document and are yet to be implemented into the search engine, it is assumed that the resources being entered will already contain tags, if not they will have to be created. Meta tags are also based on keyword search but in the present day with thousands and thousands of documents and resources of various media forms on the web a single keyword search can result in a large number of results, and most of these results are unnecessary [9]. To avoid the receiving of large amounts of necessary data, semantic descriptions are necessary as mentioned above, but for this website this is not a major issue at this point in time because the database is new and there are currently no entries but this may be future work when the database grows.

Meta Tag Generator Tools

There are various online tag generators that involve the filling out of details which consist of entering a documents title and abstract and more and on the click of a button met-tags are generated, these can then be added to the headers of the HTML document. There are also a few downloadable tools such as the Keywords Meta Tag Generator by CNET.

5.5.2. Search Experts

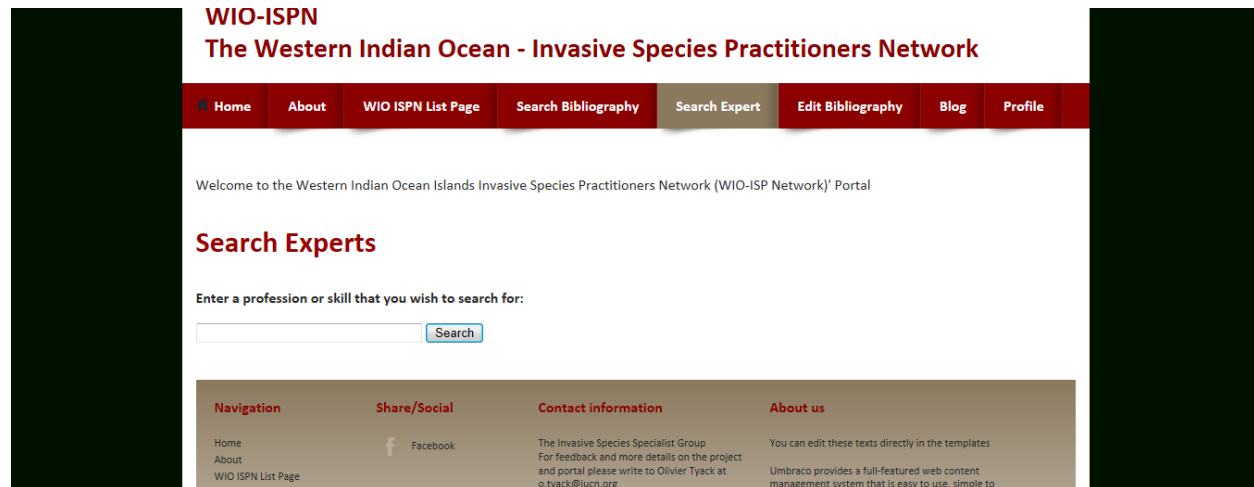


Fig 24.0-Search Experts

Users can search for an expert in the field of invasive species based on a skill; a skill can be entered into the textbox. On clicking the search button, the user receives a grid view of all the experts with that skill, they get the experts name, job title, skills, company, country, telephone number, fax, email, any research activity that they are carrying or have carried out and any articles, journal they may have written.

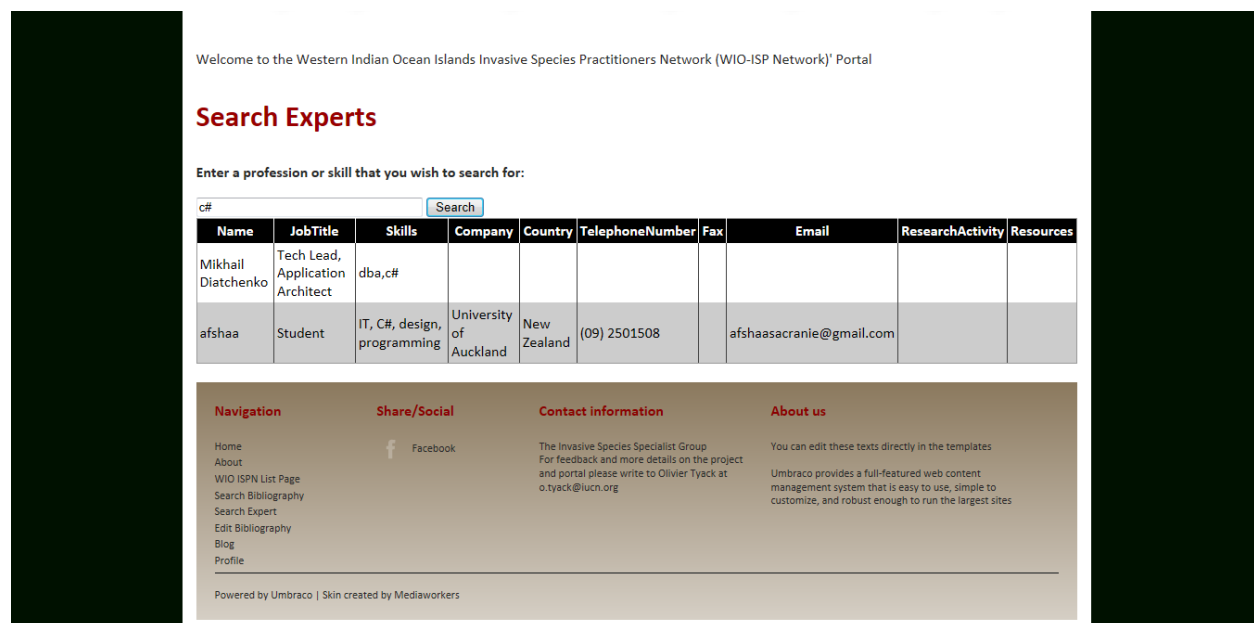


Fig 25.0-Search results for the search of an expert

Implementation

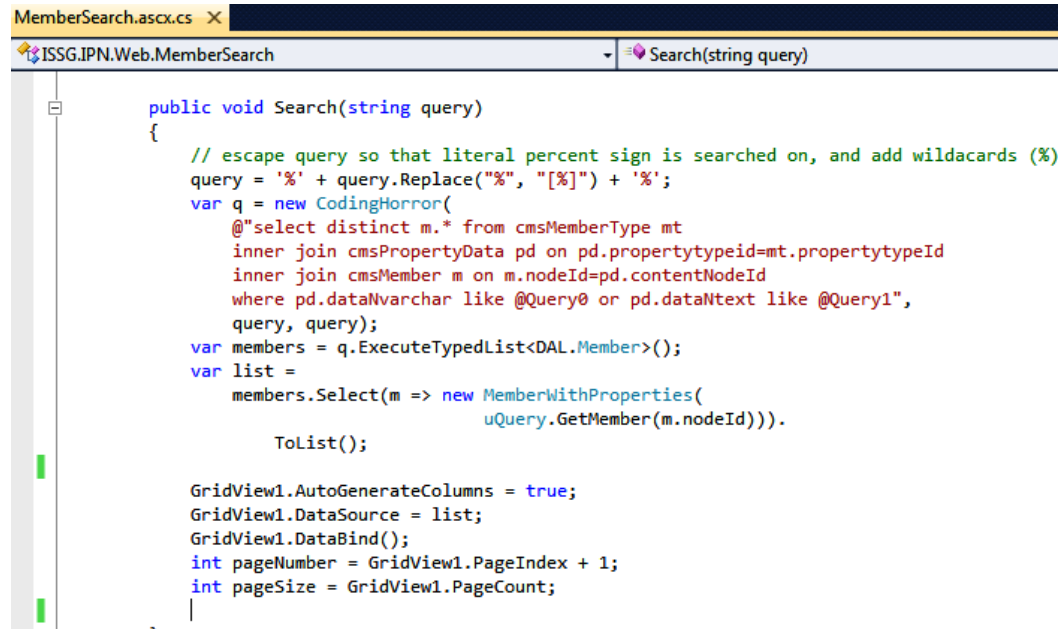


Fig 26.0-Query for the search of an expert

Since the search of an expert required getting the properties for a member from the “Members Section” on the Umbraco controller, the query was very complicated because there is more than one table involved. The DAL is used here to retrieve data from the tables in the database. The “DAL.Member” accesses the Member table from the database. CodingHorror allows the stating of the query:

1. To select all entries from the “MemberType” table, there is only one member type in the case of this website it is the “Expert”.
2. Get the property data from the “PropertyData” table where the “propertytypeid” in the “PropertyData” table matches the “propertytypeid” in the “MemberType” table.

pk	Nodeid	propertytypeid	memberCanEdit	viewOnProfile	id	contentNodeid	versionid	propertytypeid	dataInt	dataDate	dataNvarchar	dataNtext
1	1122	45	True	True	1	1057	02f45cdb-ee7c-... 28	NULL	NULL	NULL	Your Blog	NULL
2	1122	46	True	True	2	1057	02f45cdb-ee7c-... 29	NULL	NULL	NULL	Off to a g	NULL
3	1122	48	False	False	3	1057	02f45cdb-ee7c-... 30	NULL	NULL	NULL	<links />	NULL
4	1122	49	True	True	4	1057	02f45cdb-ee7c-... 31	NULL	NULL	NULL	NULL	NULL
5	1122	50	True	True	5	1057	02f45cdb-ee7c-... 32	NULL	NULL	NULL	NULL	0
6	1122	51	True	True	6	1057	02f45cdb-ee7c-... 33	NULL	NULL	NULL	<links />	NULL
7	1122	52	True	True	7	1057	02f45cdb-ee7c-... 34	NULL	NULL	NULL	<p><?UN	NULL
8	1122	53	True	True	8	1058	20825221-fa7c-... 35	NULL	NULL	NULL	<p><stro	NULL
9	1122	54	True	True	9	1058	20825221-fa7c-... 36	NULL	NULL	NULL	NULL	NULL
10	1122	55	True	True	10	1058	20825221-fa7c-... 37	0	NULL	NULL	NULL	NULL
11	1122	58	True	True	11	1058	20825221-fa7c-... 38	NULL	NULL	NULL	NULL	NULL
12	1122	61	True	True	12	1059	f7eb850e-1a53-... 40	NULL	NULL	NULL	<p><?UN	NULL
					13	1059	f7eb850e-1a53-... 41	0	NULL	NULL	NULL	NULL
					14	1060	896b4d99-b20c-... 40	NULL	NULL	NULL	<p><?UN	NULL
					15	1060	896b4d99-b20c-... 41	0	NULL	NULL	NULL	NULL
					16	1061	d1c533ff-1e14-... 40	NULL	NULL	NULL	<p>Runw	NULL
					17	1061	d1c533ff-1e14-... 41	0	NULL	NULL	NULL	NULL
*	NULL	NULL	NULL	NULL								

Fig 27.0-On the Right is the MemberType table and on the left is the PropertyData table

- Then get the member where the “node id” in the “Member” table matches the “content node id” in the “PropertyData” table. Execute the query on the Member table.

id	contentNodeid	versionId	propertytypeid	dataInt	dataDate	dataNvarchar	dataNtext
1	1057	02f45cdeb-ee7c-...	28	NULL	NULL	Your Blog	NULL
2	1057	02f45cdeb-ee7c-...	29	NULL	NULL	NULL	Off to a gr
3	1057	02f45cdeb-ee7c-...	30	NULL	NULL	NULL	<links />
4	1057	02f45cdeb-ee7c-...	31	NULL	NULL	NULL	NULL
5	1057	02f45cdeb-ee7c-...	32	NULL	NULL	NULL	0
6	1057	02f45cdeb-ee7c-...	33	NULL	NULL	NULL	<links />
7	1057	02f45cdeb-ee7c-...	34	NULL	NULL	NULL	<p> <?UM
8	1058	20825221-fa7c-...	35	NULL	NULL	NULL	<p> <stro
9	1058	20825221-fa7c-...	36	NULL	NULL	NULL	NULL
10	1058	20825221-fa7c-...	37	0	NULL	NULL	NULL
11	1058	20825221-fa7c-...	38	NULL	NULL	NULL	NULL
12	1059	f7eb850e-1a53-...	40	NULL	NULL	NULL	<p> <?UM
13	1059	f7eb850e-1a53-...	41	0	NULL	NULL	NULL
14	1060	896b4d99-b20c-...	40	NULL	NULL	NULL	<p> <?UM
15	1060	896b4d99-b20c-...	41	0	NULL	NULL	NULL
16	1061	dt1c533ff-1e14-...	40	NULL	NULL	NULL	<p> Runw
17	1061	dt1c533ff-1e14-...	41	0	NULL	NULL	NULL

nodeid	Email	LoginName	Password
1123			
1155	aaliya@gmail.c...		
1245	afshaasacranie...		
NULL	NULL	NULL	NULL

Fig 28.0-On the Right is the PropertyData table and on the left is the Member table

- Select the member where property data meets the variables.
- Call the MembersWithProperties class and pass in the member’s nodeid and in this class the properties will be displayed in a grid view.

```

[Bindable(true)]
public string JobTitle
{
    get
    {
        return _member.GetProperty<string>("jobTitle");
    }
}

```

Fig 29.0-Retreival of properties

Each property is received in this manner (Fig 29.0) and each column title for the grid view is hardcoded in and this is a problem.

Problems & Solutions

- Each column title for the grid view is hardcoded and this is a problem when the moderator deletes or changes the name of a property or adds a new property, this will neither be retrieved nor displayed in the searched results.
- The search should not only be based on a skill but also the job title and species names and there should be a wider search criteria, such as a drop down box with a few countries in the western Indian Ocean Islands, this was the initial design in the prototype I created (Fig 30.0) of the search criteria and still has to be implemented.
- The resources field entries should be links so that if the user wants to view the resource written by the expert they don’t have to go to Search Bibliography and search for it but rather just access it directly from the “Search Expert” results.

- The grid view may not be suitable to display the search results because the abstract can be a paragraph or more and this would be too large to display in a column of the view, a possible solution could be through the use of a list view as was created for the prototype (Fig 30.0) for this page, something that will display the results as Google does or the University of Auckland online library.

Fig 30.0-Prototype created for Search Experts

5.6. Blog

To make a blog post on the Umbraco Controller (site moderator):

- Right click the blog folder under Content Section on the left panel and select create.
- If a folder for the current year exists, then select BlogPost and enter the title of the post under name or else select DateFolder and enter the year in the name field and then right click the created folder and create a BlogPost.

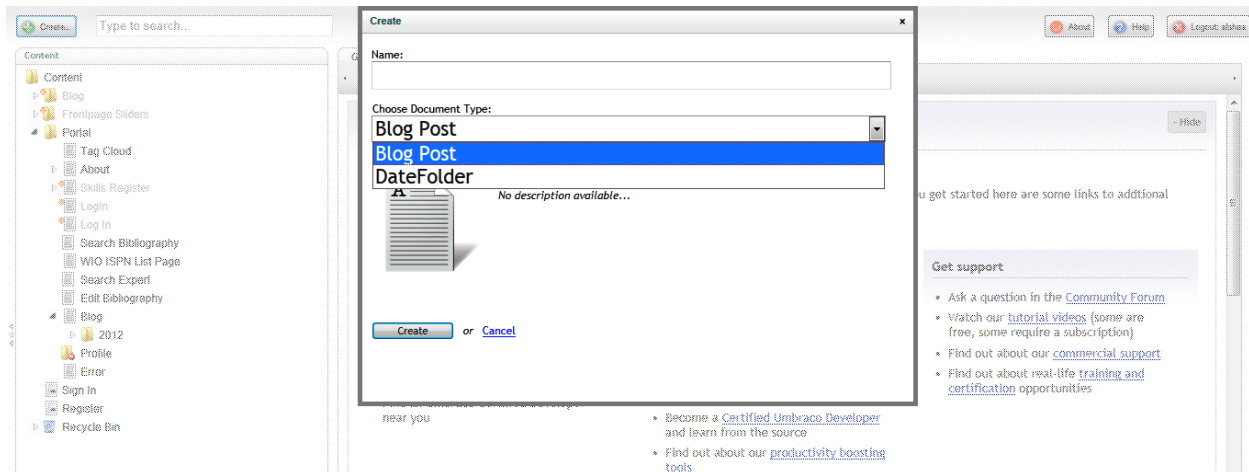


Fig 31.0-Create a Post or Folder

- Write the post in the content area on the right as shown in Fig32.0 and select save and publish. The organizational user can also tag a few words for this post.

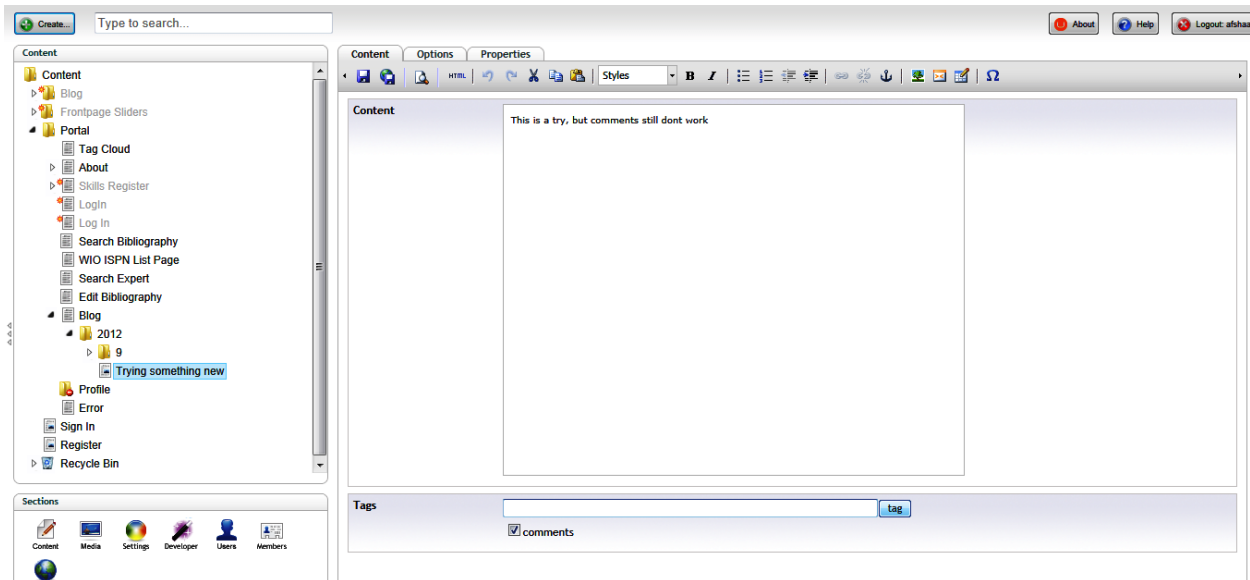


Fig 32.0-Make the post

Viewing Posts on the website (frontend users):

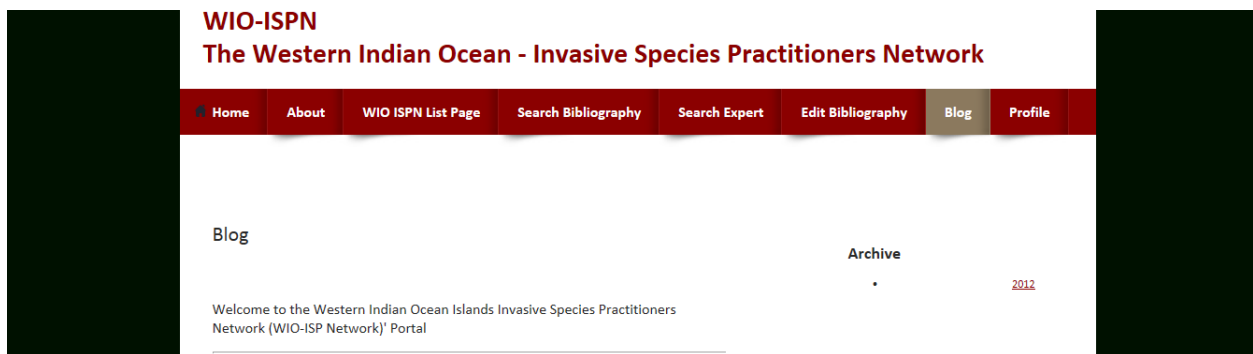


Fig 33.0-Blog on the website

Since Umbraco’s blog starter kit is used for the creation of this site, the blog functionality is included and only had to be configured. This page contains a side navigation that is used to archive the posts according to the date/year. On clicking a year under archive, the user is navigated to a list of posts made in that year (Fig 34.0). On clicking a post the user is navigated to a page with the full post and comments (Fig 35.0) where users can also subscribe to RSS Feed for the post or even save a link to the post. On this page a user can also post comments using the form at the bottom of the page.

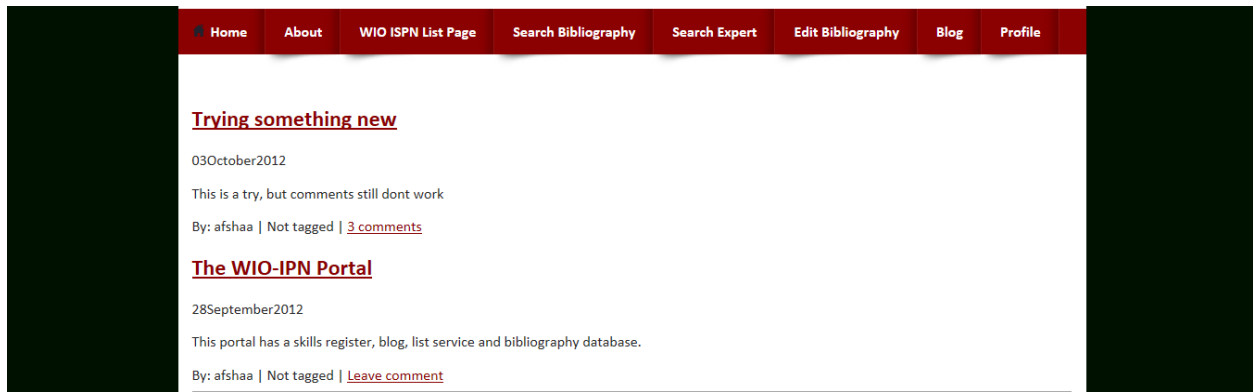


Fig 34.0-List of posts for 2012

Problems and Solutions

1. Blog Posts can only be made by the organizational users, only by those that have access to the Umbraco controller because posts are made through the controller as seen in figs 31.0 and 32.0 above. No frontend users such as the experts or members can post but they can comment. Solutions established involved integration of other blogging tools into the Umbraco site. One such tool is BlogEngine.Net which I used earlier on in the year to begin the blog but this task was pushed aside. Dotnetnuke is another blogging tool that could be used. On further discussion of this event it was decided that the current functionality of the blog is fine as it would be a means by which ISSG can communicate various information to the viewers of the site. Also, with the list service the viewers have a means by which to communicate their interesting findings and events and formulate discussions.

Trying something new

by admin, Wednesday, 3 October 2012

This is a try, but comments still dont work

Bookmark the [permalink](#). Subscribe to [RSS feed for this post](#). [Post a comment](#).

3 comments on "Trying something new"

-  Mikhail
Posted Tuesday, 9 October 2012 at 5:22:37 p.m.

Test
-  Afshaa
Posted Tuesday, 9 October 2012 at 10:07:31 p.m.

This is to see that this works
-  [Hasi](#)
Posted Monday, 15 October 2012 at 5:05:44 p.m.

hi

line1

line 22

Fig 35.0-The whole post with comments

Post a comment

Your name:

Email address:

Website url:

Your message:

• 2012

Fig 36.0-Comment Form

5.7. Login and Register

On Clicking the "Profile" tab on the menu bar the user is navigated to the login page if they are not already logged in. From here the user can register themselves if they are not already a member or else they log in and they are navigated back to the profile. The user can also navigate to the home page from both the login and registration page. Both the login and registration page do not have a layout similar to the rest of the site, they are not using the master template. As mentioned before in the paper the user can go to the registration page from the hyperlink or from the login page.

Implementation

Due to the members area already setup on the Umbraco controller, creating login and registration was simple. For the login a control named LoginView was used, it provides templates for login.

```

<div id="login" >

<asp:LoginView ID="UmbracoLoginView" runat="server">
    <AnonymousTemplate>
        <asp:Login ID="Login1" runat="server">
        </asp:Login>
    </AnonymousTemplate>
    <LoggedInTemplate>
        Welcome
        <asp:LoginName ID="LoginName1" runat="server" />
        <asp:LoginStatus ID="LoginStatus1" runat="server" />
    </LoggedInTemplate>
</asp:LoginView>
<br>

<a href="/"> Home</a>
<br>
<a href="/register.aspx">New User</a>
</div>

```

```

//create the member, and set the password and email
var m = Member.MakeNew(UsernameBox.Text, mt, new umbraco.BusinessLogic.User(0));
m.Password = PasswordBox.Text;
m.Email = EmailBox.Text;

// Add the member to the group
m.AddGroup(addToMemberGroup.Id);

//Save member
m.Save();

```

Fig 38.0-Create New Member**Fig 37.0-LoginView Control**

Problems & Solution

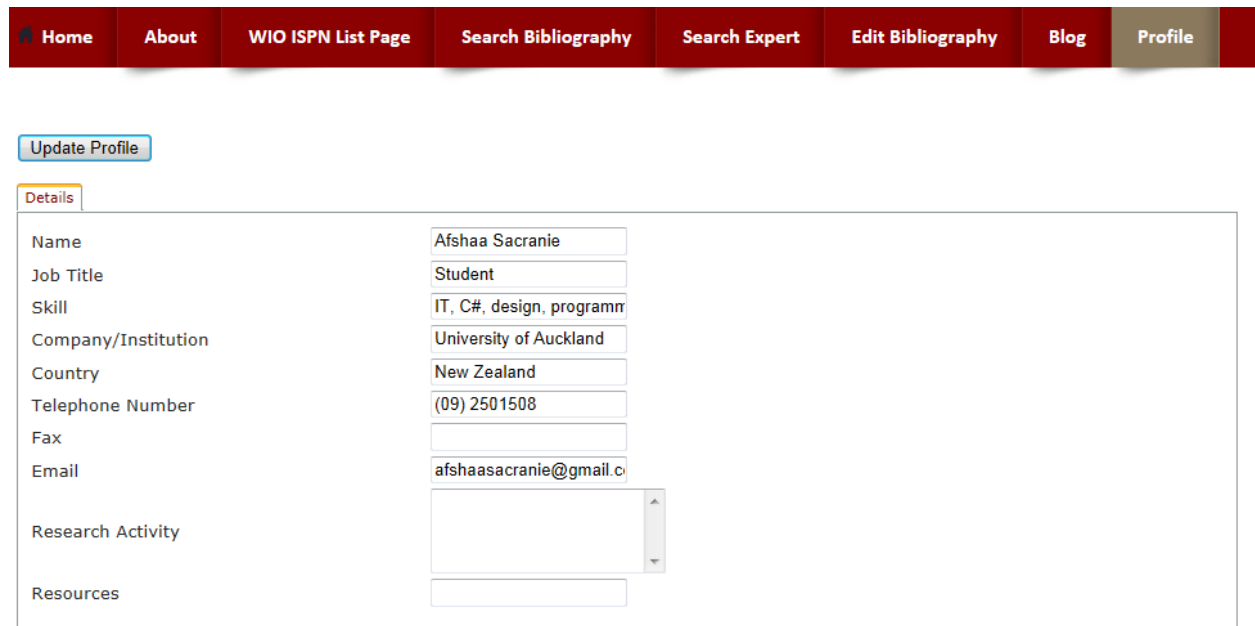
1. On the registration of a new expert, admin should get a notification so as to check that the expert is in fact specialized in invasive species and they are authenticated and validated.
2. The newly registered user should receive a confirmation email on their registration.

Fig 39.0-Login
Fig 40.0-Registration

5.8. Profile

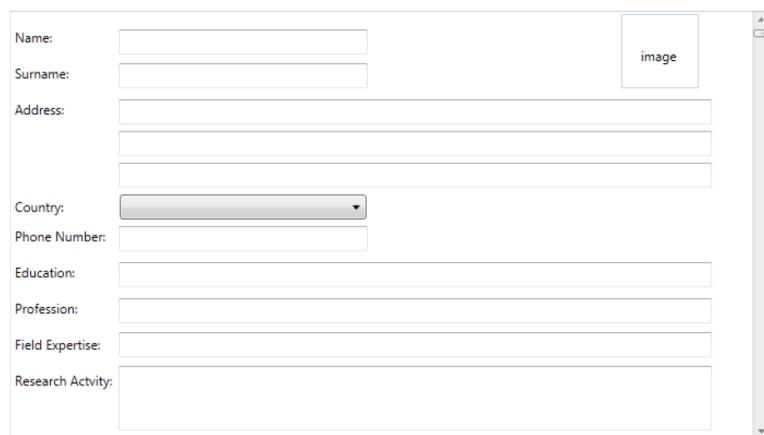
The profile allows an expert to update or edit their details and a newly registered expert to enter their details. The form in fig 50.0 shows the information that is required to be entered and these details appear when the expert appears in search results on the “Search Expert” page. When a user has entered or updated their details and clicks the “Update Profile” button,

a pop-up window appears asking for confirmation after which a message shows up notifying the user that the update has taken place.



Update Profile	
Details	
Name	Afshaa Sacranie
Job Title	Student
Skill	IT, C#, design, programn
Company/Institution	University of Auckland
Country	New Zealand
Telephone Number	(09) 2501508
Fax	
Email	afshaasacranie@gmail.com
Research Activity	
Resources	

Fig 41.0-Profile



Name:		image
Surname:		
Address:		
Country:		
Phone Number:		
Education:		
Profession:		
Field Expertise:		
Research Activity:		

Fig 42.0-Profile

In comparison to the prototype (Fig 42.0) I had created for the “Experts Registration”, there are a few differences in that the expert’s actual address is not necessary but rather their company or institution is required. Also, rather than their education, their job title and skills are required

and the contact details are pretty much the same. Like the prototype, an image option would be preferable and suitable in the sense that this is a “Profile”.

On the success of an update the data is also updated on the controller in the members section under the user’s name. In comparison to the “Search Experts” results the profile is more efficiently implemented for if the moderator changes, deletes or adds a property or even changes the details in a property’s field on the controller, this change will be reflected on the profile, in other words the change will be visible on the profile. The moderators can also add a tab on the Umbraco controller (Fig 6.0) and this will be seen on the profile along with the properties for that tab.

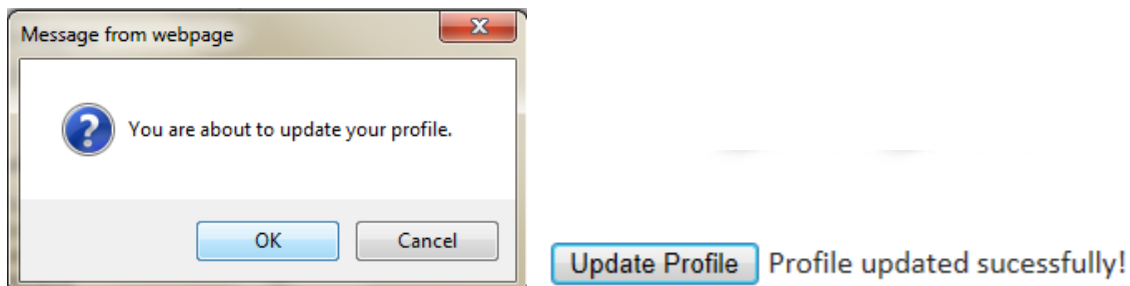


Fig 43.0-Updating User Profile On the Website

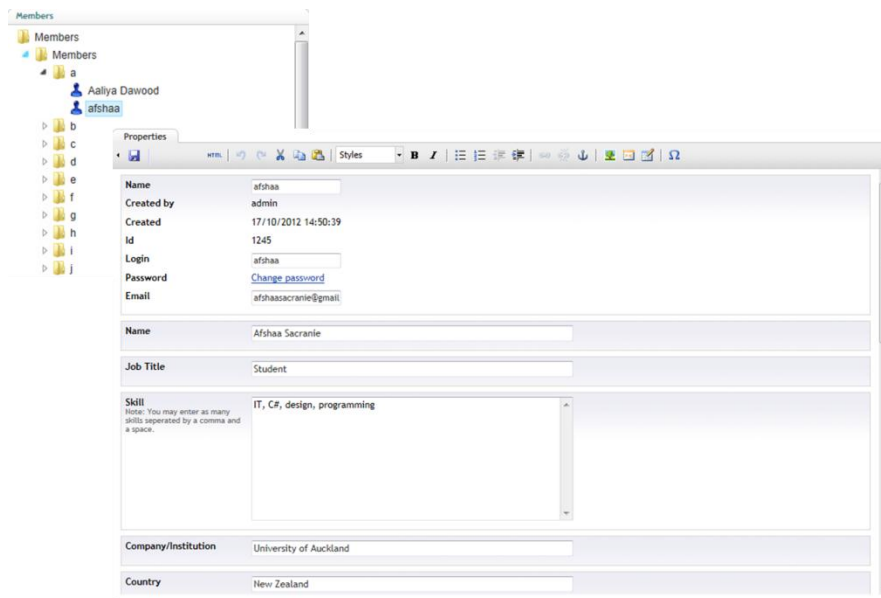


Fig 44.0-Members Properties

Implementation

```
// Iterate through membertype tabs
foreach (var tab in _currentMemberType.getVirtualTabs)
{
    PupulateTab(tab.Caption, tab.PropertyType);
}

// Iterate through properties on tab
foreach (var propertyType in propertyTypes)
{
    // Check if property is allowed to be viewed
    if (!_currentMemberType.ViewOnProfile(propertyType))
        continue;

    // Build the property GUI
    var propertyLabel = new Label {ID = string.Format("lbl{0}", propertyType.Alias), Text = propertyType.Name};

    // Table Row
    var propertyRow = new TableRow();
    propertyTable.Rows.Add(propertyRow);

    // Row Cells
    var labelCell = new TableCell {Width = Unit.Percentage(33)};
    var propertyCell = new TableCell {Width = Unit.Percentage(66)};

    propertyRow.Cells.Add(labelCell);
    propertyRow.Cells.Add(propertyCell);

    // Check for property background image
    var imagePath = GetBackgroundPath(propertyType);
    if (imagePath != string.Empty)
    {
        var bitmap = new Bitmap(HttpContext.Current.Server.MapPath(imagePath));
        propertyCell.Height = Unit.Pixel(bitmap.Height);
        propertyCell.Width = Unit.Pixel(bitmap.Width);
        propertyCell.Style.Add("background", string.Format("url({0})", imagePath));
    }

    // Add Label and Property to cells
}
```

Fig 45.0-Entering Tab Content

Once the tab is created, it is filled like a table after which the current user properties are retrieved and entered into the table as shown below.

```
textField.TextChanged += this.Editor_TextChanged;
textField.Enabled = _currentMemberType.MemberCanEdit(propertyType);
propertyPanel.Controls.Add(textField);

private void Editor_TextChanged(object sender, EventArgs e)
{
    var member = Member.GetCurrentMember();
    var alias = ((TextBox)sender).ID.Replace("editor", "");
    var value = ((TextBox)sender).Text;
    CurrentProfile.SetProperty(alias, value);
    CurrentProfile.Save();
}
```

Fig 46.0-Updating Code

Fig 46.0 shows the current member's properties are retrieved and set.

Problems and Solution

1. For the “Skills” field in the form, more than one skill can be entered, due to the assumption that an expert can have skills in more than one area of the invasive species field. Users do not have any way of knowing that they can enter more than one skill into the textbox separated by a comma because there is no description beside the textbox instructing them of this. There is a simple solution of adding descriptions to the “MemberProfileEditor” user control and re-adding it to the site.

6. Future Work

There are a few requirements of the project that have yet to be fulfilled. There is the language translator, the Webinar, the photo gallery and other minor implementations.

6.1. Language Translator

Even though the website overcomes the distance barrier between the Western Indian Islands and the rest of the world, there is still a language barrier. Languages in the region include Spanish, English, French, Dutch and more.

Google Translate [12] is a website translator plugin that provides languages, the plugin can be added to the Umbraco website as it works well with other tools. After the Google translate API is added to the site and a user visits the website and selects French from the drop down selection the existing text is replaced with French text, this would work well for the website, especially the blog.

Another good tool is the Microsoft Translator Widget; this Widget is added after the site is created. Briefly, the steps involve, going to the site www.microsofttranslator.com/widget where the developer enters the URL of the website and a few other details, this will add a translation system to the website.

Both these tools are simple and easy to implement and use and they will translate the website fully but it may not translate the journals, articles and books that the user navigates to from “Search Bibliography”. There are various other means by which a user can translate these resources as well using online Google translate or downloading of tools like CNET Web Translator and SYSTRANet.

6.2. Live Conference Call Facility

ISSG requires a means by which they can carry out a web conference through this website and there are many webinar service providers; however most of these provide the service at a cost. Some website live calling tools are Microsoft Office live meeting; Skype too provides this service, but at a cost. Facebook uses Skype’s facilities to enable video chats. There is still the

task of finding a good service provider, implementing the control onto the website and testing its efficiency.

There is an issue with network connectivity in the Western Indian Ocean Islands areas that will affect the quality of the video conference and also the issue of time difference though this is minor.

Who would use this facility? The organizations members/experts, who want to discuss an upcoming event or an important meeting for which they cannot travel overseas. It is assumed that ISSG members would also register themselves as experts. The experts that will use this facility are distinguished from the other frontend experts in that they are ISSG contacts or members and take part in the organizations activities:

1. A new “Member Type” will have to be created specifically for these members
2. The users profile can contain a tab called calendar, which displays the current month in a grid format (Fig 47.0). On this tab, the site moderators/maintainers can enter upcoming events or enter reminders for web conferencing meeting dates.
3. The profile page should contain an icon, with a camera image that the user can click and start a live video chat tool. As mentioned above there are many tools that can be implemented into or used by the site.

October 2012						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8 Columbus Day	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31 Halloween			



Fig 48.0-Icon that indicates Video Call

Fig 47.0-Calendar view for the tab in “Profile”

6.3. Photo Gallery

The most recent addition to the requirements of this site is to include a photo gallery to display images of invasive species; each image will contain corresponding information such as the organism type, species name, common name, country where they originate from, what environments they are likely to be found in. All users can upload images to the site; however there is the issue with images having a poor quality and of being different sizes. The photos being uploaded therefore need to be transformed so that they are of a high quality; the gallery has to be well thought off. The media section of the Umbraco controller can take care of any

storage and retrieval of images. In the case that many images exist on the site, a search engine for the images should be created like the one Google has.

6.4. List Service

Even though a list service is readily available, possible future work would be to create a list service unique to this website, the current list service may contain so many items that may not be specific to the Western Indian Ocean Islands and therefore creating a new list service would exist exclusively for that part of the world. There are many tools available that can be used to develop a mailing list service, such as Google groups and Yahoo groups which are the two most popular and commonly used tools. Another good tool is Electric Embers' NPOGroups which may be better than Google and Yahoo groups in that there are no unnecessary advertisements and NPOGroups allows customization and branding which would probably be preferable [7].

7. Problems Encountered

1. By mid-year I decided to start implementing and get started, I created a visual studio website where I connected to an MS. Access and MS. Excel database. I created a simple blog site using Blogengine.Net using Microsoft WebMatrix and created a few fill out forms for expert's details. This was before Umbraco was decided as the tool for the project. My laptop crashed and I had lost all my work, the hard drive was completely unsalvageable and the work could not be retrieved, everything was lost along with research and documentation from the first semester. Within one day I got a new hard drive and started recreating everything when the decision was made to use Umbraco and I started development using Umbraco. Lesson was learnt and an external hard drive, USB, WebDrop Box and Tortoise SVN was used to backup of everything since then.

8. Achievements and Experience

8.1. Goals

By the end of October Ms. Shyama wanted the main functionalities of the website ready for use, though some of these functionalities are not perfect they do carry out their tasks at a simple level.

8.2. Work Experience

I have gained many skills and knowledge from my industrial mentors and have experienced how development teams work together and what a working environment feels like. I have learnt how important it is to ensure that the client's expectations are met and how it is necessary to keep both our superiors and the client informed on the progress of the work. I have learnt that work can be shared and discussed so as to ensure the best outcome and I learnt to confide in

my mentors when I was absolutely unsure on how to carry out a task. This work experience has prepared me for when I join the workforce next year.

8.3. Application of Skills and Knowledge

Throughout this project, I had a chance to apply my programming skills, knowledge on various aspects that I have gained. Throughout my four years in this course I have come across DAL's and version control. I received a chance to apply my knowledge of these in theory, I used data access layers to access information in databases as shown earlier in this paper and version control was applied through the use of Tortoise SVN. Acronym had set up virtual connection on my laptop for me, which I could use to access the Umbraco controller and view the site; also the Visual studio project was kept a stable version using TortoiseSVN. If I made a change to a user control in visual studio then I would commit the file I made a change to with a log message explaining what I have done to the user control. This was a good means by which my industry mentor could see what I am struggling with and be able to help me.

8.4. Polished Programming Skills

The project has enabled me to polish my programming skills and get better at ASP.NET and how to use various tools with the language.

9. Conclusion

Though development only began in the middle of the year, I have successfully achieved the basic functionality of most of the requirements of the website. Website users can register to ISSG's list service and receive news and share information, they can search for an expert based on skills, and they can search for information in the form of online articles, journals and more on the subject of invasive species, based on the resources title. Users can enter resources into the systems that allow others to search for it and users can register themselves to the website, and have a profile which they can use to edit their details. I have researched various tools that can be used for the future development of a language translator and a webinar facility. At present, this website enables Invasive Species Practitioners to find and contact other specialists all over the world and to find and even submit resources with information on the various invasive species in the world.

The "Search Expert", "Search Bibliography" and the "Edit Bibliography" require a little more work before the site can be launched. This should be an estimation of one month's more of work on these three areas and after these areas have been perfected, the remaining requirements, the webinar and language translator can be focused on. A meeting is yet to be held with Ms. Shyama and Mr. Chris for feedback on the site to date.

With the project being a yearlong and involving research, implementation, meeting new people, experiencing the work environment, it has been a great learning experience. In the world of IT no work is completely finished, there are always new problems, better ways to do things, there are always additions and upgrades, there is innovative tools and technology created frequently and there is always more to learn.

All industries require some form of IT, working for ISSG and Acronym has given me experience in the development side of this field. There will be more functionality to add to the Western Indian Ocean – Invasive Species Practitioners Network to ensure that it allows the efficient and effective communication between Invasive Species Practitioners.

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