

# **BTECH 451**

## **END OF SEMESTER PROJECT REPORT**

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*For The Invasive Species Specialist Group*

*By Afshaa Sacranie*

*University of Auckland*

### **Abstract**

It is vital to preserve our environment and when a threat is introduced, it is essential to take action and prevent any harm by it. To protect the ecosystem from any threats it is important to first understand the danger and to gain knowledge and information on how to manage the threats. This study aims to research websites that support information sharing and communication and to thoroughly analyse the layouts of the websites. The research will then be applied to the development of a website which will solely be for information exchange and networking.

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## 1. Introduction

The BTech degree is a four year course with the final year being an honours year. The BTech honours students are required to carry out a yearlong project that will allow them to apply their skills and knowledge learnt during the first three years of the course. The project will involve working for some industry and creating a solution to some problem that the company assigned to the student may have. The project will give the students experience in a working environment as well as experience in business processes. All industries require an IT department because technology is being used for all kinds of business processes and handling vast amounts of data since there is a shift from the analog to the digital world. These companies can be specialising in cars, the creation of dairy products or even the handling of species. All these companies require a technological mechanism by which they can manage their data.

The organization that I was assigned specialises in invasive species, invasive alien species are animals, plants or other organisms that are introduced into a new environment or geographical region, which is out of the range of their natural distribution. When these species rapidly increase and disperse in these areas this is known 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. Invasive species practitioners take part in preventing any harmful effects by invasive species and communicate their practices and knowledge. The organization that I am working with is the Invasive Species Specialist Group (ISSG) of the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN) 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.

## 2. Problem Statement

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 has multiple MS Access databases with information crossing over, resulting in redundant data. ISSG therefore entails a working, advantageous platform that will enable them to carry out their activities. They require a way in which to share the information in the database easily and efficiently. Communication with other Invasive species practitioners and networks requires the sharing of research, experiences, knowledge and innovation which results in new data that could

potentially be added to the database. Hence the ISSG needs a means by which to collaborate and integrate data from different sources.

With the change in the ISSG's requirements comes the need for a new system, the increase in information on the various invasive species results in the need for a system that can manage and handle libraries upon libraries of data on the various invasive species and for the growing number of specialists, a list of experts and their skills.

With contacts near the Western Indian Ocean, communication becomes a challenge, firstly because of the distance and another due to the language barrier. It is not possible to overcome the time differences but when worked around and a time is set for a web conference then there is the question of how many people can be part of the video conference or if the connection has no disturbances.

As mentioned above ISSG's main activities involve networking, information exchange and giving technical and policy advice and some of the challenges that the group faces directly affects these. ISSG therefore has to overcome these issues to carry out their aim without difficulty.

### **3. The Solution**

The problems mentioned above can be resolved through the development of a portal for invasive species practitioner's networks that will enable them to carry out the various activities of the networks. This portal is known as the Western Indian Ocean Islands - Invasive Species Practitioners Network Portal (WIO-ISPNI). It is envisaged that the WIO-ISPNI portal is a website that will provide a space for storage and access to relevant documents, a space for exchange of experiences, lessons learned, research and innovation, it will also promote communication with invasive species experts.

### **4. Project Objectives**

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

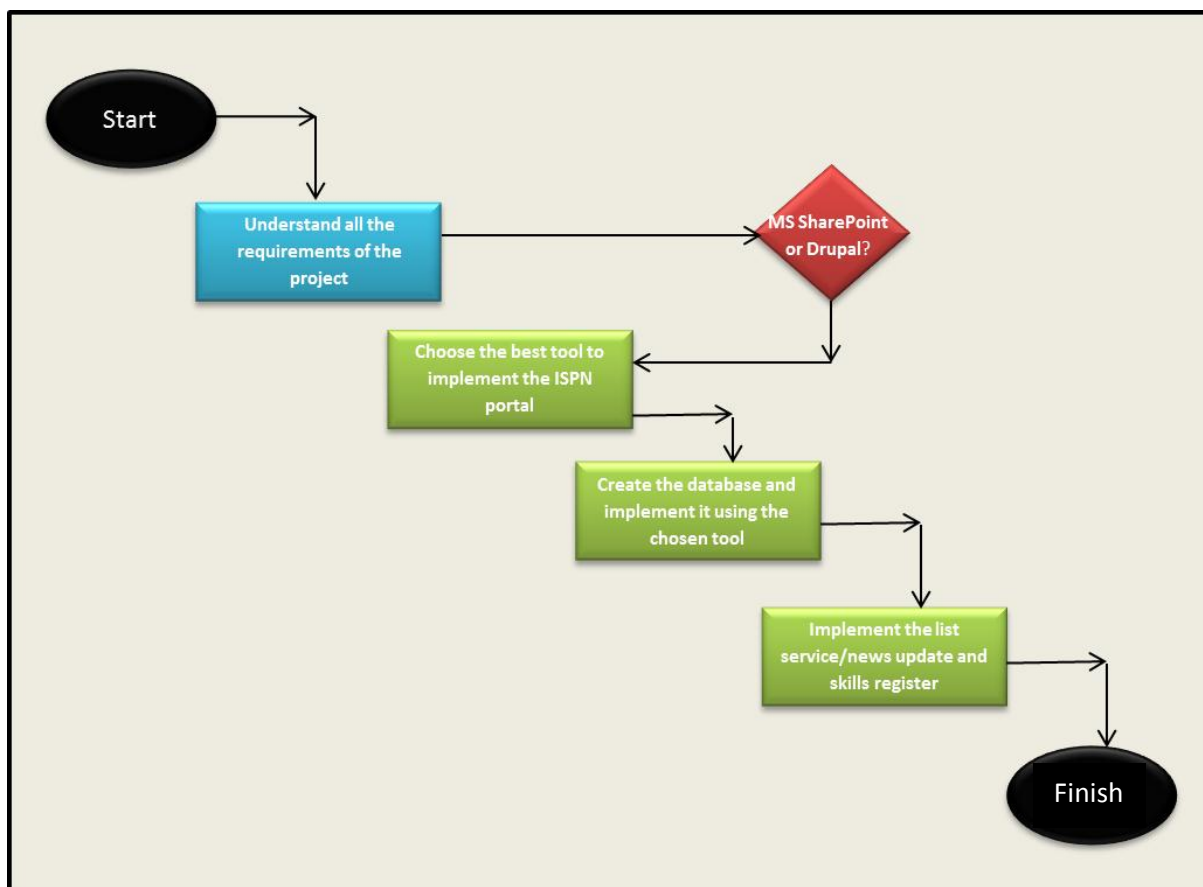
### **5. Project Scope**

The scope of the WIO-ISPNI portal project is to deliver a process by which invasive species practitioners can search for relevant information on the numerous invasive species, possible methods to avert their introduction into the environment and ways to control and eradicate them. The portal will also offer an area for discussions, where people can exchange experiences, knowledge, research and more. Also, the portal will permit practitioners and other relevant invasive species experts within the region to register their skills and expertise. The possible users of this

portal are 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.

## 6. Workflow

This is an image describing the steps in the project; the green rectangles represent uncompleted tasks.



## 7. Requirements

The first step was to understand the requirements for the project in order to develop the best solution to meet the groups aim. The ISSG requires:

- a. An online Bibliography database or document manager - where users can store and retrieve documents. The document manager will use an archival system for storing and accessing information to support information exchange and prevent data redundancy.

- b. Skills register – where users can register their contact details and list their skills and expertise, anyone can use these details to contact them and this facilitates networking.
- c. A list service/blog - to communicate news updates and exchange, resources, ideas, experiences, knowledge and innovation, this supports both networking and information exchange.
- d. Language translator - for Multilanguage functionality, to make information understandable in various languages, this is important for communication with any of the island groups and also since languages like French and Portuguese are used in countries in the Western Indian Ocean region.
- e. A webinar facility - to support group conferencing and communication from remote locations.
- f. RSS Feeds – to update users on any new data that is made available on the portal, users can subscribe to feeds.

## 8. Technical Requirements

- a. Make it Simple and User Friendly
  - Simple content, activities, administration
  - Ensure tasks are not time consuming
  - Resources should be easy to access
  - Instructions must be clear and concise
- b. Users ought to be able to use the ISPN portal without supervision within a few weeks of its inception

## 9. The Portal Features

The main features of the Western Indian Ocean Invasive Practitioners Network (WIO-IPN) portal will include the following pages:

- a. The home page consisting of space for News updates/blog and links to other resources including Webinar facility
- b. Bibliography database/ Document manager with search functionality
- c. Skills register
- d. Network list service page
- e. Webinar space page with information on how to communicate
- f. The database and list service should have an RSS feed facility

## 10. Research

### 10.1 Bibliography Database/Data Management System

Example site for the retrieval of information from the database:

An example found that seemed similar to the layout intended for the search system follows. The Sociological Abstracts Bibliography database by CSA ILLUMINA has a good search engine design and results layout<sup>6</sup>.

Fig 10.1.1

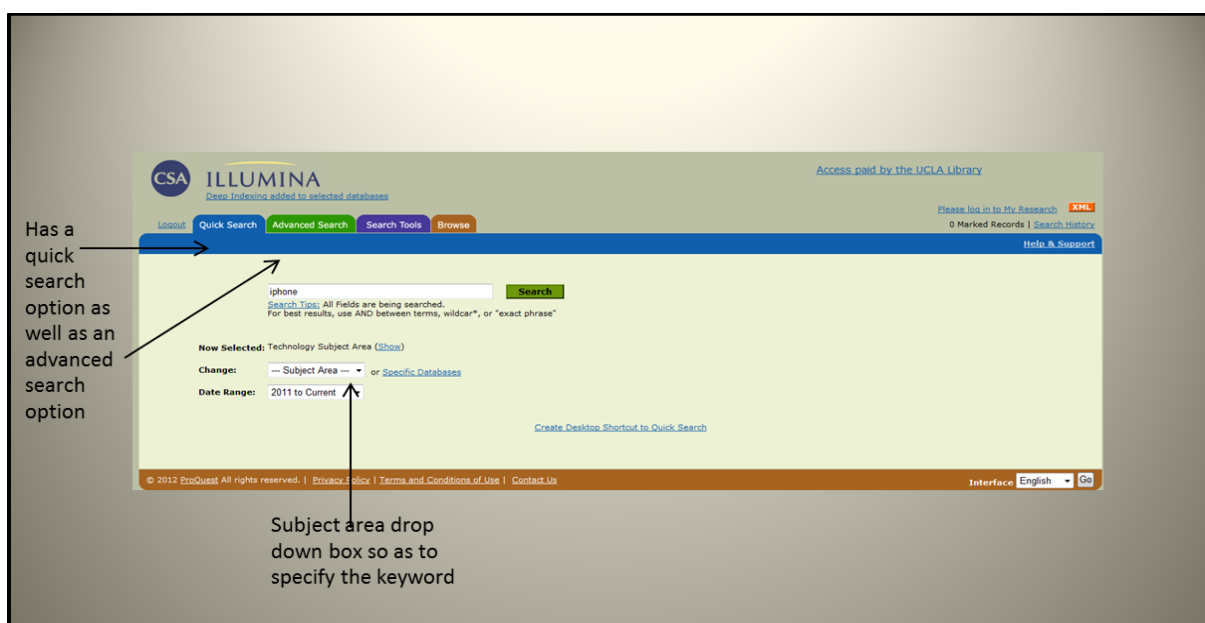
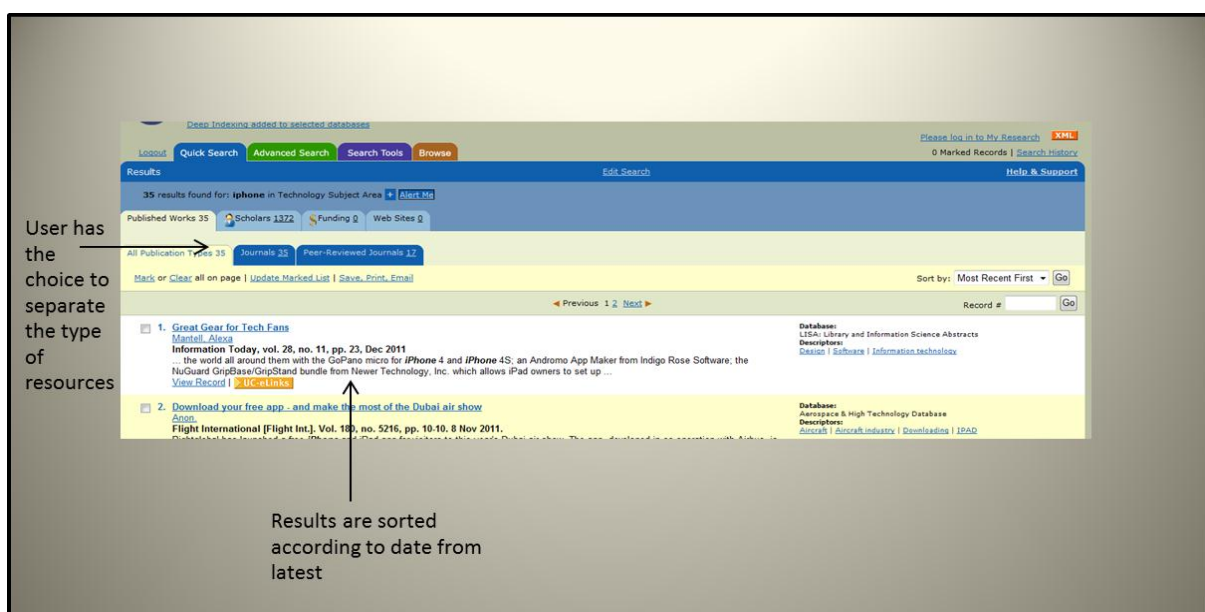


Fig 10.1.2



## Example site for the storage of information into the database:

This is an example from document database<sup>11</sup>.

Fig 10.1.3

For storage/uploading of new information on the database

**Document Database** [Home] [Character Help]

**Document Data**

**Help:** The name(s) of the author(s). The syntax for names is Lastname1, Firstname1 and Lastname2, (First Names2), and de la Lastname3, Firstname3 and G[ø]rdel, Kurt

Document ID: 11  
Document Type: article  
File Name: 11-blair\_2005.pdf  
File Type: pdf  
Entry Created by: jkaps  
Entry Date: 2009-01-08  
Document Uploaded: 2009-01-08  
Entry Modified:  
Document Data Public: ☐ True ☒ False  
Document Public: ☐ True ☒ False  
bibtexid:  
author: Blair, T  
title: On the (British) -- (American) Friendship  
journal: Political Sciences  
number: 8  
volume: 23  
pages: 13-17  
month: August  
year: 2005  
Collection:  
On File: ☒ True ☐ False  
note:  
Submit Reset Form

The Document Database is © Jens-Peter Kaps, 2003 - 2009 v. 1.4

Details on the resource

On clicking submit the new resource will be entered into the database

## 10.2 Skills Register

Example site for accessing information from the skills register:

For the skills register the Daisie - search expert's website seemed to meet the criteria of the project<sup>7</sup>.

Fig 10.2.1

The user can enter criteria to search for an expert in their region

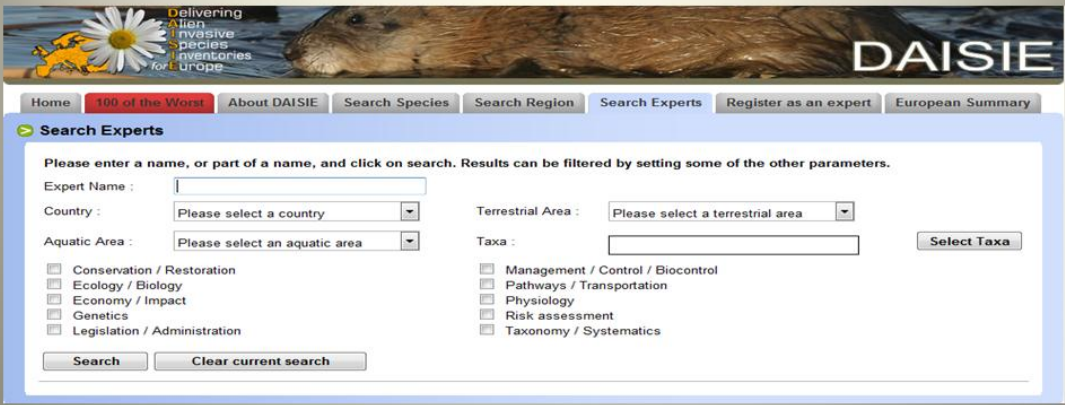
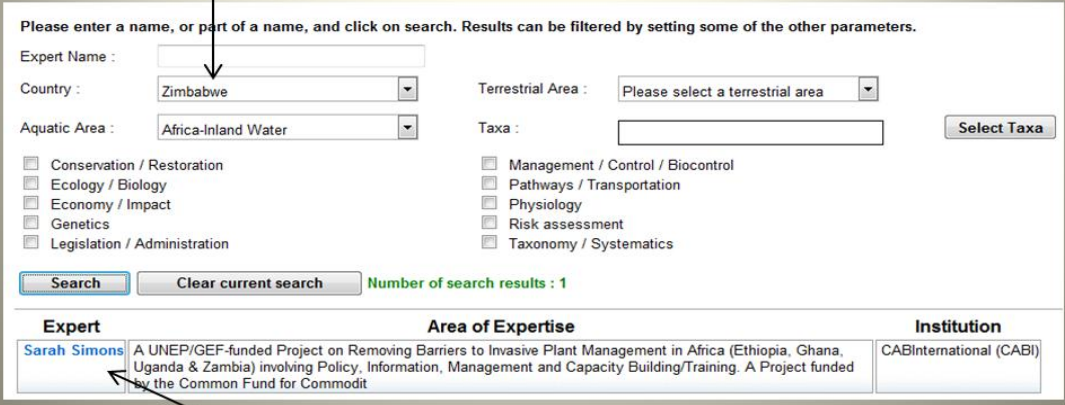


Fig 10.2.2

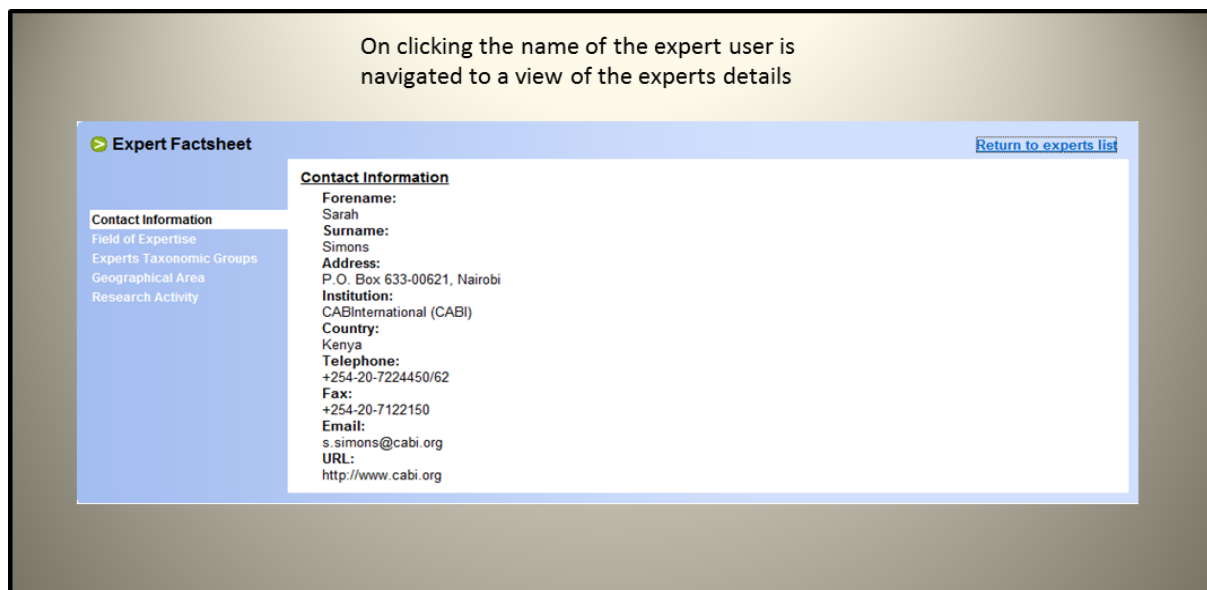
Search criteria entered



| Expert       | Area of Expertise                                                                                                                                                                                                                                      | Institution             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Sarah Simons | A UNEP/GEF-funded Project on Removing Barriers to Invasive Plant Management in Africa (Ethiopia, Ghana, Uganda & Zambia) involving Policy, Information, Management and Capacity Building/Training. A Project funded by the Common Fund for Commodities | CABInternational (CABI) |

Result: One expert found

**Fig 10.2.3**



Another site which is a good example is LinkedIn; it is a professional social networking website where users register their contact information, their skills, hobbies, education and interests. Users can also upload their CV and a photo of themselves.

## 10.3 Blog

### List Service/ Blog news update:

A network member can blog their ideas and use RSS feeds to alert users of new posts. The blog is restricted to be only on Invasive Species topics. If a user wants to post on this list service, they will have to enter information in a fill out form layout which consists of the date, title, author and the blog post before it appears on the page. These blog posts can be searchable, so a user can enter a search for a specific blog and this would navigate them to a page with a list of results that meet the criteria.

A good example is Google Groups supports group discussions<sup>10</sup>.

Fig 10.3.1

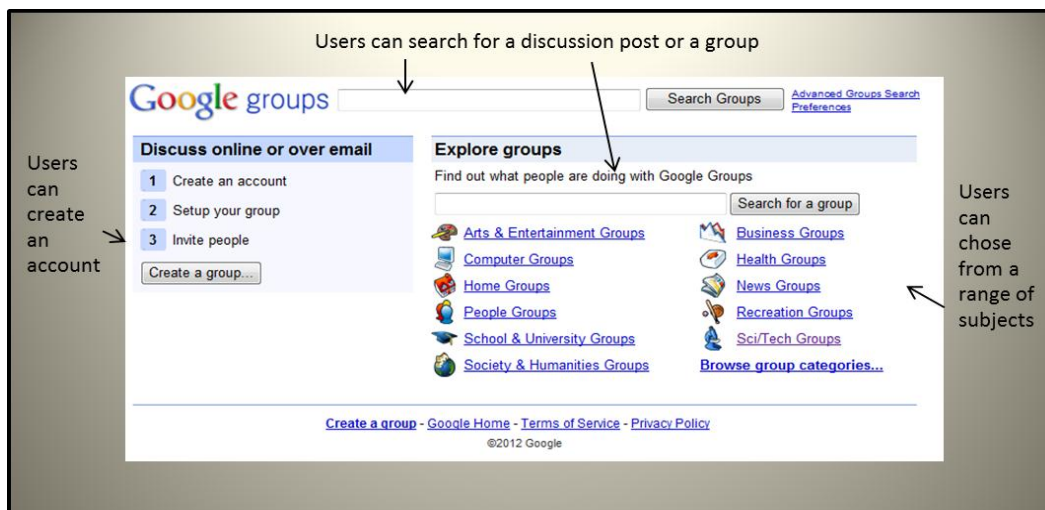
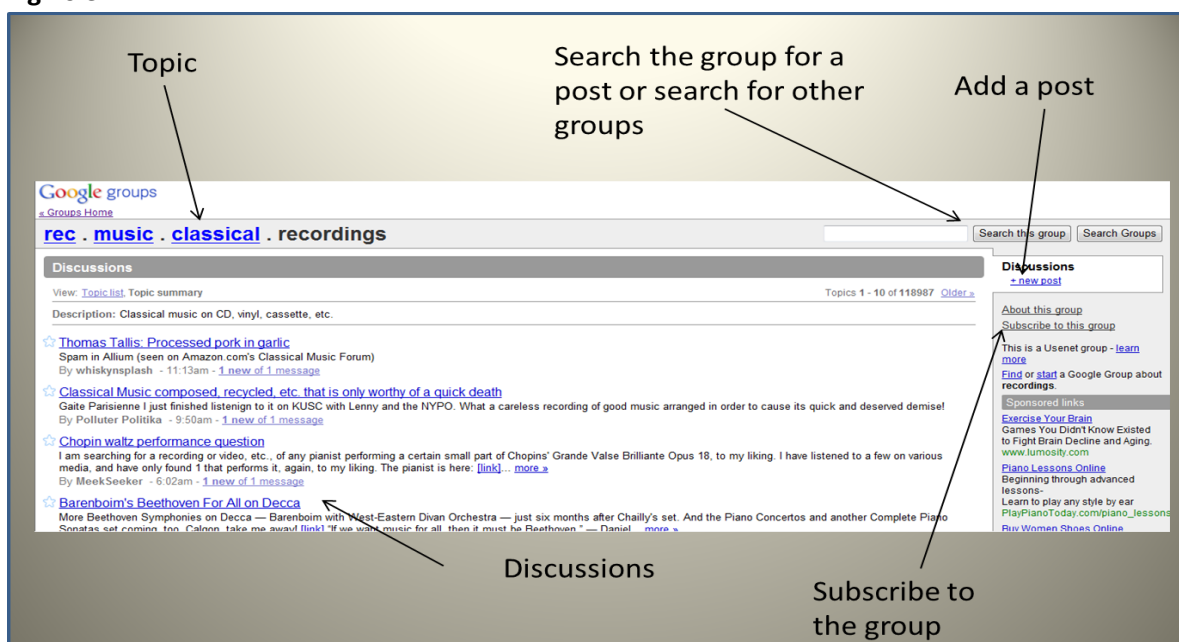


Fig 10.3.2



## 11.Functionality and Prototype

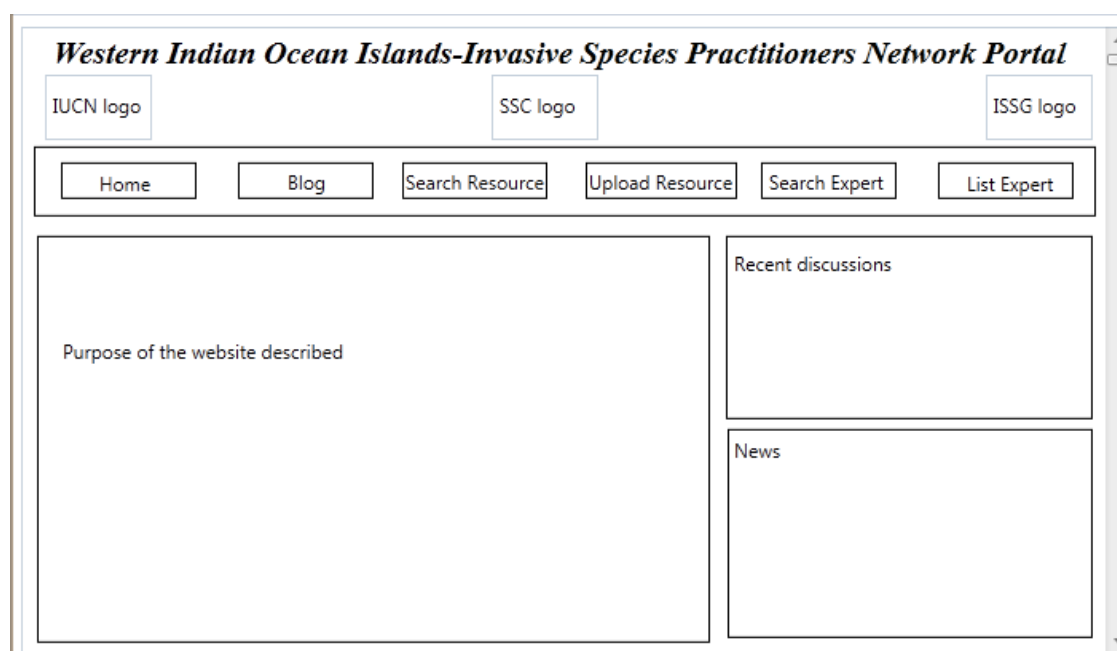
Note: these are design ideas that were prototyped; they are not the final output.

### 11.1 Home Page

The home page is the first page that users see. The home page needs to capture the attention of users, the ISSG, IUCN and SSC logo should appear on every page and the title of the website/portal should appear on every page as well. The page will have introductory information on the purpose of the website, it may also contain recently added blog posts or most read blog posts, any news feed in the world of invasive species and most read articles, journals, etc. The page can consist of tab options or preferably a menu option for a professional look; these are links to the other areas of the portal. This menu option will be visible at the top of every page as well. These links are:

- Search Species (Fig 11.2.1) – navigates the user to a page where they can build a query and search for information on invasive species.
- Upload Resource (Fig 11.2.4) – directs the user to a page with a fill out form layout where they can enter details of a particular resource relating to invasive species that they want to add to the database.
- Search Experts (Fig 11.3.2) – links to a search page where the users can build a query to find a specialist or practitioner within their region with a specific skill in a particular field.
- List Experts (Fig 11.3.1) – takes the user to a page which also contains a fill out form layout in which to enter their details and list their skills
- Blog (Fig 11.4.1) – navigates to a page where users can read already visible blog posts or search for particular discussions, take part in them or add a blog post.

Fig 11.1.1

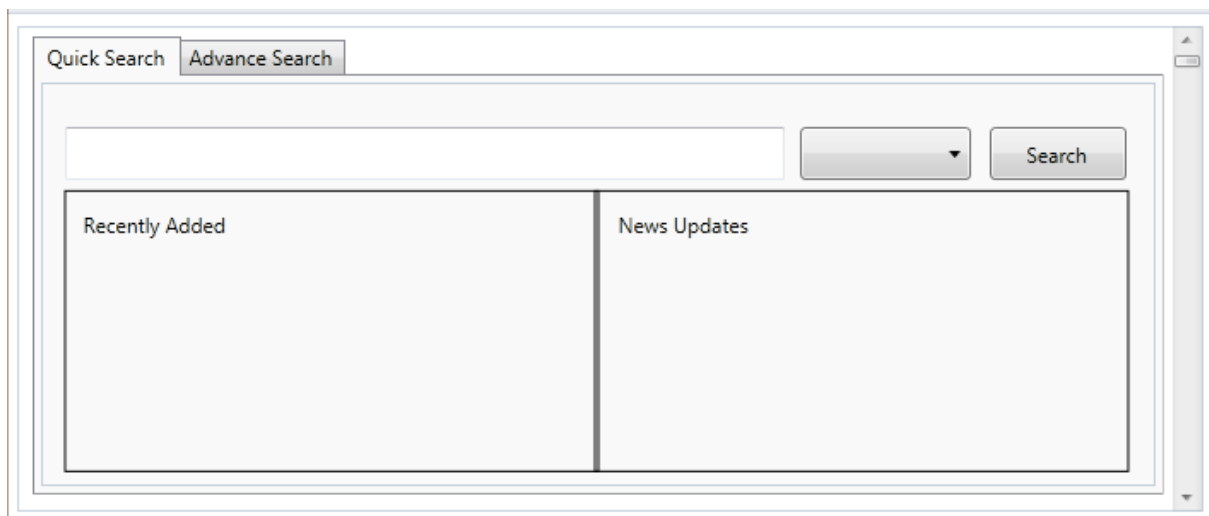


## 11.2 Bibliography Database

Network members can store and retrieve resourceful information on various invasive species; this information can be articles, journals, books and much more.

### Bibliography Database Information retrieval:

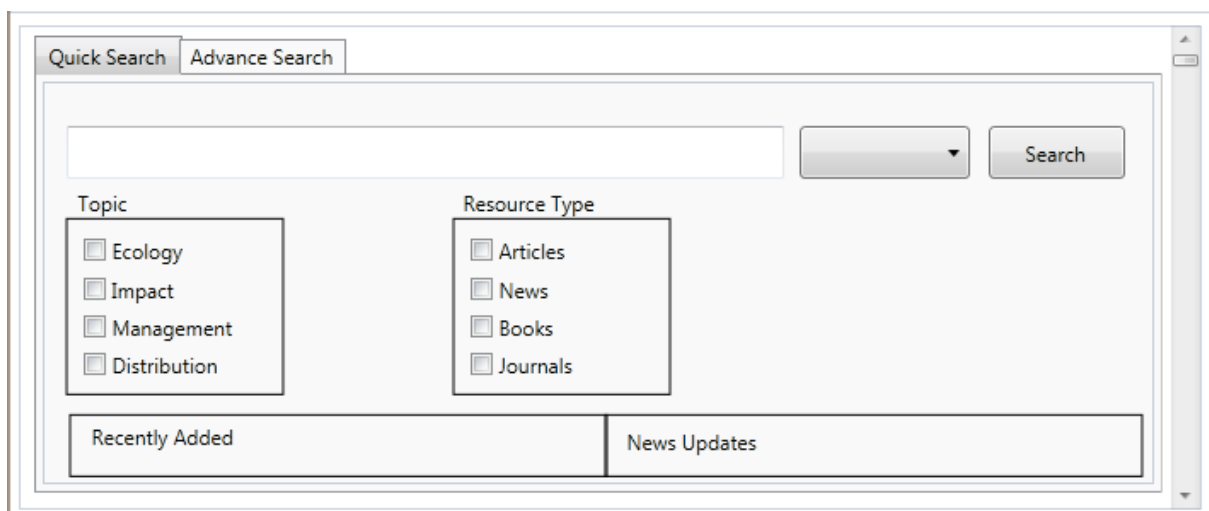
**Fig 11.2.1**



The screenshot shows a web interface for a bibliography database. At the top, there are two tabs: "Quick Search" (selected) and "Advance Search". Below the tabs is a search field with a dropdown arrow and a "Search" button. The main content area is divided into two columns: "Recently Added" on the left and "News Updates" on the right. Both columns are currently empty.

User can enter a keyword in the search field and choose a subject area from the combo box to specify the search. The combo box will have the options author, title, name of species and listed theme, these will relate to the entered keyword. The page will also contain recently added resources and news feed on any invasive species topics.

**Fig 11.2.2**



The screenshot shows the "Advance Search" interface. It has the same "Quick Search" and "Advance Search" tabs at the top. Below the tabs is a search field with a dropdown arrow and a "Search" button. Below the search field are two columns of checkboxes. The left column is labeled "Topic" and contains four options: "Ecology", "Impact", "Management", and "Distribution". The right column is labeled "Resource Type" and contains four options: "Articles", "News", "Books", and "Journals". At the bottom, there are two columns: "Recently Added" on the left and "News Updates" on the right. Both columns are currently empty.

The user can use the advance search (Fig 11.2.2) in which they can enter a keyword and specify it by selecting an option in the combo box, also by selecting a topic they outline the area that they are

most interested in and they also have the choice of selecting a resource type. The options for the different areas which the user can select to meet the intention of the search are ecology, management, distribution or impact.

- Ecology - characteristics of the species
- Distribution - how the species spread
- Management - ways in which to prevent the introduction and to control the spread or eradicate an invasive species
- Impact - the effect that an invasive species can have on the surrounding environment or to other species in the same environment

The use of check boxes is so that users can select more than one option. For example the user enters *Aaadonta angaurana* a type of Mollusc in the search entry field and selects “species name” in the combo box and the user can select more than one topic such as impact to know the effect the organism has on the environment and management to get information on how to control or prevent its impact. The user can also select more than one resource type so articles and books or just books.

On clicking search the user is navigated to a view of all the information or resources presented by the search criteria.

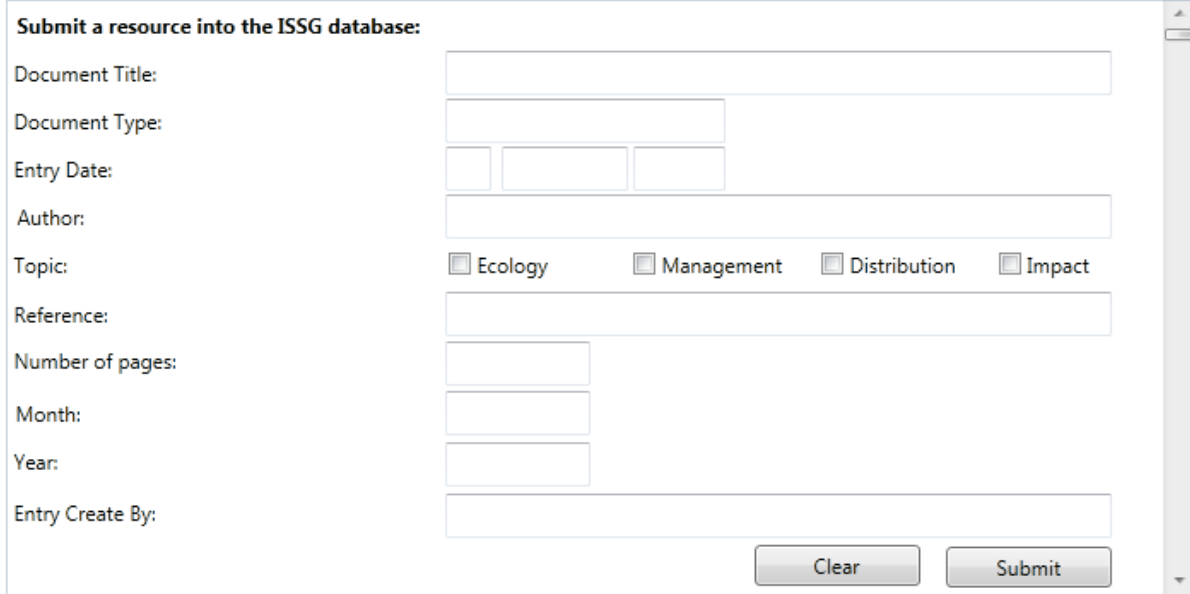
**Fig 11.2.3**

The screenshot shows a web-based search interface. At the top, there are two tabs: 'Quick Search' and 'Advance Search'. Below the tabs is a search input field containing the text 'Aaadonta angaurana'. To the right of the input field is a dropdown menu labeled 'Species name' with a downward arrow, and a 'Search' button. Below the search bar, there are two search results displayed. The first result is titled 'The Most Dangerous Molluscs' and includes the following information: 'Published: 12 August 1865 by Lady Bird', 'Reference: www.mollusc.com', and 'Abstract: Mollusc are dangerous because they ...'. The second result is titled 'Mollusc and their habits' and includes the following information: 'Published: 10 July 1990 by Jimmy Neutr', 'Reference: www.habbits.com', and 'Abstract: Mollusc are dangerous because they ...'. The interface has a simple, functional design with a light gray background and a white search bar.

The result will then be retrieved from an archival database system before it is presented. The search will navigate the user to a page where all the resulting resources are displayed. If the quick search was used then the results will be displayed under the quick search but if the advanced search is used then the results will be displayed beneath the advance search layout. Users can read each result's abstract to gain a little insight into what the resource is about, the abstract will also contain a “read more” hyperlink that will either slide into a view of the full abstract or it will navigate the user to another page with all the information on the resource and a full abstract. On clicking the reference the user will be taken to the resource. If the author of any of the results is listed in the skills register, their name may appear as a hyperlink to their contact details.

## Bibliography Database Information storage:

**Fig 11.2.4**



Submit a resource into the ISSG database:

Document Title:

Document Type:

Entry Date:

Author:

Topic: ☐ Ecology ☐ Management ☐ Distribution ☐ Impact

Reference:

Number of pages:

Month:

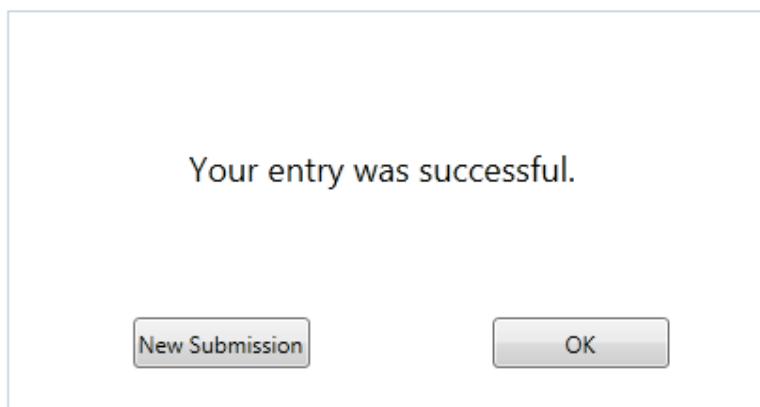
Year:

Entry Create By:

Only network members are allowed to store/upload resources onto the database and so to do this they will have a view of a fill out form layout in which to enter the details of the resource. The information entered about the resource includes, the title of the resource, the date it was published, author(s), an abstract and most importantly a reference. This reference is a hyperlink that will navigate to the actual resource. After new data is submitted into the database the next step would be to choose keywords and metadata or tags that will enable the location of this information when it is being searched for. Through the use of RSS feeds the users can be notified of any new data that has been uploaded onto the system.

After entering all the details into the form layout as shown above the user has the option of either clearing all the entries in the fields and redoing the whole form or submitting the information into the database. After submission the user will get a pop-up view asking whether to make another entry into the database or select "ok" to stay on the fill out form page where the user can use the menu options to navigate to any other page.

**Fig 11.2.5**



Your entry was successful.

### 11.3 Skills Register

It is a page where people can look up an expert with particular field expertise and where experts can register themselves and list their expertise and skills.

#### Skills Register List Expert:

Invasive Species practitioners and specialists can register to have their contact details and skills and expertise listed on the website. When registering them an expert also has a view of a fill out form in which they enter their information. This information can be an ID image, contact details such as e-mail address, phone number etc. and information on their profession and skills in the area.

There will be a mechanism to ensure that only invasive species experts, specialists and practitioners are entered into the system. Also, before any information is entered in the system there will be a policy agreement authorising the user and also to ensure the expert that the site is safe to proceed with the submission of their information. The “Research Activity” field has to include any work they have done in their field of expertise and any writing they have done on invasive species, if these are already in the database then they will appear as hyperlinks to users viewing this expert’s information.

**Fig 11.3.1**

The form is titled 'Skills Register List Expert' and contains the following fields:

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

There is also a box labeled 'image' for an ID photo. A vertical scrollbar is on the right.

### Skills Register expert search:

Fig 11.3.2

The screenshot shows a web-based search interface for the Skills Register. At the top, there are three input fields: 'Name' (a text box), 'Country' (a dropdown menu), and 'Field' (a dropdown menu). To the right of these fields is a 'Search' button. Below the search fields, the results are displayed in a scrollable area. The results are listed under the heading 'Results'. The first result is for 'Green Lettuce', followed by 'Cotact Information:', 'Field of Expertise:', and a 'View Research' link. The second result is for 'Bob Red', followed by 'Cotact Information:', 'Field of Expertise:', and a 'View Research' link. The interface has a simple, functional design with a light background and a vertical scrollbar on the right side of the results area.

| Results                                                                                             |
|-----------------------------------------------------------------------------------------------------|
| <b>Green Lettuce</b><br>Cotact Information:<br>Field of Expertise:<br><a href="#">View Research</a> |
| <b>Bob Red</b><br>Cotact Information:<br>Field of Expertise:<br><a href="#">View Research</a>       |

A user can also search for an expert; they can enter search criteria that will lead them to a list of experts and their information. On searching for an expert, search results slide into view on the same page, each result has an expert name, contact details and field of expertise. On selecting “View Research” the user is either navigated to the result page of the bibliography databases search, with resulting resources that the expert has created, else to an empty result page with a “no results found” notification.

## 11.4 Blog

### Blog search:

Fig 11.4.1

Search Discussions

Search Add a Post +

Recently added:

**Why are ferrets not allowed to be domestic pets?**  
In my opinin ferrets are very fun and lovina creatures ther are not pests...:  
By SpeciesSaviour  
1/05/2012

**Possums are taking over!**  
Most recently i had an encounter with the most maanificent creature, it was rummaqing through my trash ca...  
By NeedPeace  
12/4/2012

Results

**Locusts go wild in Eagt!**  
Did you hear about the abundance of locusts in cairo homes recently? While some mav think this is insane i think Awsome!!  
BugExpert

When searching for a discussion users are on a page with the most recently added posts. The search results appear at the bottom, it slides into view and users can select a post by clicking the title after which they will be navigated to a view of the whole discussion. Users can also add a post by selecting the add post sign.

Fig 11.4.2

Search Discussions

Search Add a Post +

Recently added:

**Why are ferrets not allowed to be domestic pets?**  
In my opinin ferrets are very fun and lovina creatures ther are not pests...:  
By SpeciesSaviour  
1/05/2012

**Possums are taking over!**  
Most recently i had an encounter with the most maanificent creature, it was rummaqing through my trash ca...  
By NeedPeace  
12/4/2012

Results

**Locusts go wild in Eagt!**  
Did you hear about the abundance of locusts in cairo homes recently? While some mav think this is insane i think Awsome!!  
BugExpert

whole post

comments by other people

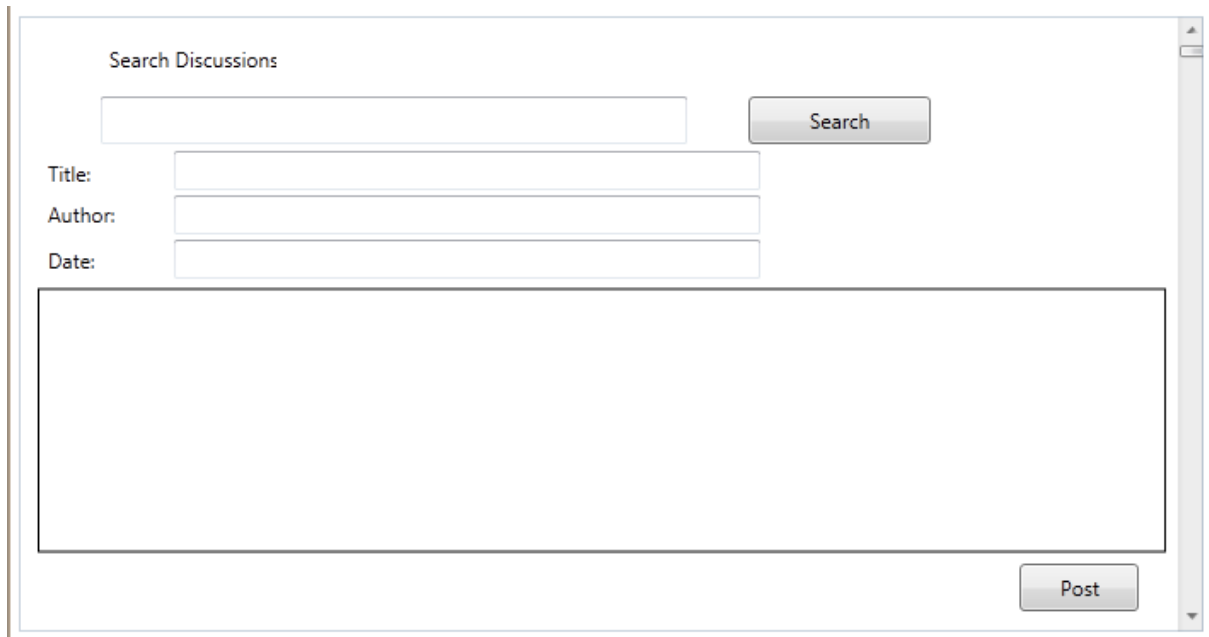
comment...

Subscribe

Post

When users view a particular discussion they can view other's comments and also post their own comments and take part in the discussion. Sometime experts and resources can be mentioned in posts that leads users to the skills register or database search. Users can also subscribe to posts by that particular blogger or that particular post. On clicking subscribe the user in navigated to a page where they enter their email address to receive notification whenever a post is made.

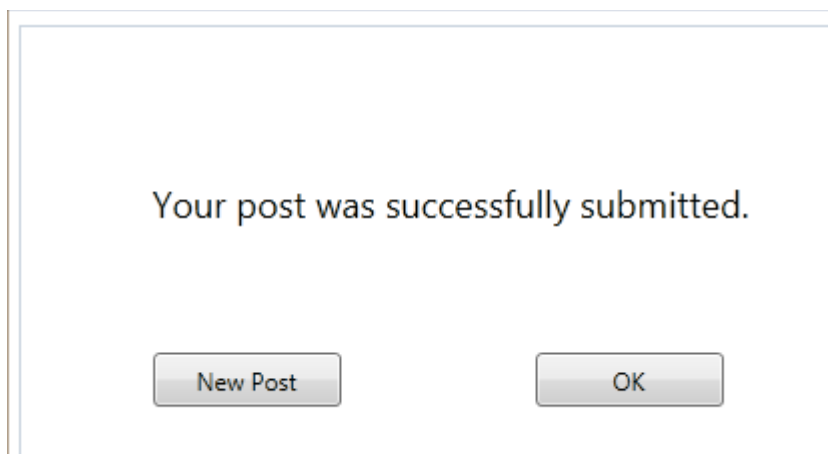
**Fig 11.4.3**



The screenshot shows a web form titled "Search Discussions". At the top, there is a search bar with a "Search" button. Below this, there are three input fields labeled "Title:", "Author:", and "Date:". To the right of these fields is a large, empty rectangular box for the discussion post content. At the bottom right of the form is a "Post" button.

On entering a post the user must add a title, their name and the date as well as the discussion post.

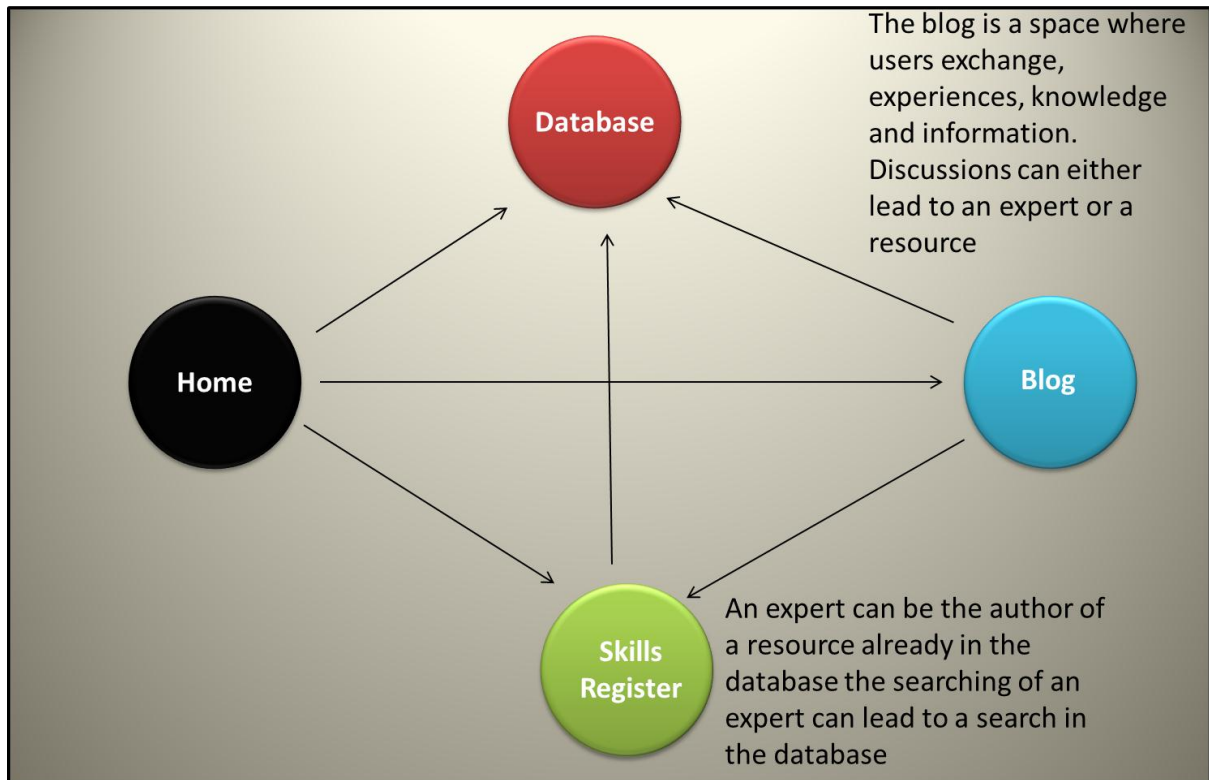
**Fig 11.4.4**



The screenshot shows a notification box with the text "Your post was successfully submitted." centered. Below the text are two buttons: "New Post" on the left and "OK" on the right.

Once the post button is clicked the above notification pops-up. If the user wants to make another post, they click on "New Post" else they click on "OK" to stay on the current page and use the menu for navigation to another page.

## 12. Webpage Flow Diagram



## 13. Tools

At first the use of programming skills and software's were considered, to start implementing the project from the ground up using languages such as ASP.net and tools such as visual studio but as the systems requirements were further studies it was acknowledged that this would be time consuming and would be a lot of work. From this realisation, it seemed that the use of configuration tools would in many ways be less time consuming and easier but the question was which tool would be best for this project?

When considering tools the cost is an important factor and so we have to consider a tool that has low development, administrative and maintenance costs.

The first configuration tool considered was Dotnetnuke, it is an open source web development framework as well as a content management system (CMS), its template language is ASP.net and programming language is C#. It supports all the requirements of the project.

### Pros and Cons of using Dotnetnuke<sup>3</sup>:

| Pros                                                  | Cons                                                                                   |
|-------------------------------------------------------|----------------------------------------------------------------------------------------|
| User friendly – making the development process easier | If a module doesn't exist, it takes in-depth .NET knowledge to develop a custom module |
| Can easily change the look of the website             | There are many versions of Dotnetnuke and                                              |

|                                                                                                                                                                                                                                                                                                                                   |                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                   | upgrading to newer versions may be a challenge and may take a lot of time                                             |
| Built in security and user management, the developer can easily set authorisation on who can make the changes to the website and even set the accessibility of users – important since the project is collaborated with Acronym a development company, some developers from the company will accessibility as well as the student | Dotnetnuke works best with a Windows environment – this is not a major issue however it does matter to a small extent |
| There have been many websites made using Dotnetnuke and so there is a lot of development and technical support – when developer has a mind block and does not know how to use a particular feature they can easily consult the support system                                                                                     |                                                                                                                       |

Microsoft SharePoint sever 2010 is another well know web application platform, it supports all the requirements of the project as well<sup>8</sup>.

#### Pros and Cons of using MS SharePoint Server 2010:

| Pros                                                                                                                                                                                                                                          | Cons                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ability to work collaboratively with other MS tools – beneficial since creation of database may be in MS Access, the two tools can easily be linked and can work efficiently together making it convenient for the developer <sup>1and2</sup> | 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     |
| A creative an user friendly tool– making the development process easier <sup>1and2</sup>                                                                                                                                                      | SharePoint/SQL server has a limit of 2 Gb for storage of any single file in the repository. It is a large amount for ISSG so it is not a major <sup>12</sup> . |
| The tool decreases the costs by integrating the intranet, extranet and internet sites on a single platform which promotes quick and easy implementations that can meet the changing needs of the group <sup>1and 2</sup>                      |                                                                                                                                                                |
| This tool is also beneficial for the end users in that it enables them to search for and work with other ISSG members and other invasive species practitioners <sup>1and 2</sup>                                                              |                                                                                                                                                                |
| No need for tedious programming because the technology enables you to create applications and develop solutions without the need for code <sup>9</sup>                                                                                        |                                                                                                                                                                |
| It's easy to create users and groups to modify permissions and access to certain documents <sup>9</sup>                                                                                                                                       |                                                                                                                                                                |

Taking in to consideration the many advantages in comparison to the disadvantages, it seems that MS SharePoint server is the right tool for this project.

**Dotnetnuke vs. MS SharePoint Server 2010:**

|                       | Dotnetnuke                                                                                        | SharePoint                                                                |
|-----------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Portal Framework      | Unlimited pages per site, unlimited modules per page, ability to display module on multiple pages | Limited storage capacity, but you can always move the data to a SQL serve |
| MS Office Integration | No                                                                                                | Yes                                                                       |
| Browser Support       | Works only on windows                                                                             | Works on both Firefox and windows                                         |

Another configuration instrument for website development that is similar to MS SharePoint server 2010 is Drupal. Drupal is a Content Management System (CMS) and a content management framework (CMF); it is used to create sites sometimes with the use of coding with PHP or CSS for an advanced development.

**Pros and cons of using Drupal<sup>5</sup>:**

| Pros                                                                                                                                                            | Cons                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Will be inexpensive to maintain the website – upside since cost needs to be kept to a minimum                                                                   | It's is simply not as user friendly as MS SharePoint server 2010 – because SharePoint server is used more than Drupal                      |
| Has all the basic features that are sufficient enough to create a basic website, blog, database and more                                                        | It takes time to load due to the number of its tools and capabilities – slows the development process but this is also not a major concern |
| It has good tools, templates and themes that supports the initiation of the website and saves time – important in creating a professional and good looking site |                                                                                                                                            |
| It allows network integration, feeds, search engine optimization tools and more                                                                                 |                                                                                                                                            |

**SharePoint vs. Drupal:**

|                    | SharePoint                                                                  | Drupal                                                                                  |
|--------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Content Management | The platform has Microsoft product integration and file management features | Does not have Microsoft product Integration and only has basic file management features |
| Set up             | Setting up a local development environment is difficult and expensive       | Free to use and cost efficient to set up                                                |
| Operation system   | Only windows                                                                | Multiple operating systems                                                              |

**Dotnetnuke vs. Drupal:**

|            | Dotnetnuke   | Drupal   |
|------------|--------------|----------|
| Difficulty | Intermediate | Advanced |

## 14. Feasibility Study

Before starting the development process there is a need to answer a few questions:

- **Economic:** Are the benefits greater than the costs? Since ISSG is a non-profit organisation, it is of utter importance that costs are kept to a minimal amount. Also, because this is an educational student project, the development costs are cut down by half the amount. However payment is being made to a development company known as Acronym that is assisting in the development of the portal. The considering of open source tools such as Dotnetnuke and Drupal, eliminates the costs involved in accessing the tools for development, however if MS SharePoint server were to be used, this has already been obtained and setup through University of Auckland contacts. To answer the question, the benefits will definitely outweigh the costs because costs are reduced and ISSG will have a portal developed solely to carry out their activities and assist Invasive species practitioners in obtaining reliable information to prevent harmful impact by invasive species on their native ecosystems.
- **Technical:** do we have the technology required for development? A decision still has to be made in selecting the most appropriate tool for the development of the WIO-ISPAN portal. All tools being considered do meet the requirements mentioned above and have the ability to implement every aspect of the portal to support networking and information exchange. The decision had been made on using SharePoint but that was before Drupal had been introduced. All these tools are available and the open source ones can be installed on individual PC's, with MS SharePoint Server 2010, the development site can be accessed remotely and requires internet connectivity which is also available.
- **Operationally:** Will the target audience accept and use the product? If the end product is efficient and effective in meeting the requirements and has the ability to carry out its purpose without any problems then the users will accept and use the product. As mentioned before the users are meant to be ISSG members, Invasive species practitioners on the island groups and other invasive species specialists and networks. All these users will use the portal for communication and information exchange. If the portal does what it is meant to, then invasive species practitioners on the island groups will be able to access data, exchange information and share experiences, knowledge, best practice and innovation with the other users. If the portal helps the user get the information or expert that they need then it will be accepted. With the designs being simple and familiar, users will be able to relate to it and already understand its functionality, it will therefore be user friendly and easy enough to use by anyone.
- **Schedule:** How long will it take to create the portal and will it be done in time? The time given for the project is about a year. By November 2012, ISSG is required to have at least a working online bibliography database/data management system, a skills register and a blog. The language translator and webinar facility are features that can be added at a later stage because at this moment basic communication is the aim of the project.

## **15.Desired Outcomes**

A working WIO-ISPAN portal, that allows invasive species practitioner carry out their activities efficiently and have a website that supports ISSG's aims for another couple of years.

## **16.Data Management and Site Maintenance**

The site should be designed in a manner that will reduce the time required for data management and site maintenance. It is necessary to ensure that the site remains current and outdated entries are removed, though it was mentioned that entries are rarely removed, once they are on they stay on, this may need to change to prevent unnecessary usage of space especially by data that is no more valid.

## **17.Constraints**

- a. There is a time constraint of one year that the student developer has to develop the website, though this may seem enough, the student may have limited amount of time that can be spent on the project along with other studies. The student will therefore require effective time management skills.
- b. Good practices are necessary to develop and design the website.
- c. There is a requirement for the best software

## **18.Next Step**

To select the appropriate tool, a decision had been made to use MS SharePoint Server 2010 but after a recommendation of using Drupal since SharePoint is expensive there is a need to research Drupal and the costs involved in the use of each development tool. After the selection of the tool the development process can begin.

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