FINAL YEAR PROJECT

CM0343 – 40 Credits

INTERIM REPORT

"Label It"

A study analysing the relation between user
demographic information and how they label an image.

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Abstract

The objective of this study is to recognise patterns and connections in the way we label and name objects within images, according to the demographic information we possess. By using a simple web based image labeller, data will be collected and stored to be analysed and mined. Thus resulting patterns that occur when individuals who are of different demographic information categories label images.

This interim report focuses mainly upon why this study is to be conducted, data collection methods for this study, what tools are needed and a design of the chosen method, the web labeller.

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1. **Introduction**

We are constantly tagging and labelling objects, whether via the medium of social media or items that we can touch. Labels (also known as tags) are used to specify explicitly what or who the content of that object is about.

There are tools which involve human efforts and picture labelling. However these tools exist in order to give sematic content and information to an image as computers otherwise do not understand how to search for them. Tagging and labelling images from a demographic point of view is something I believe to be overlooked and has yet to be fully exposed.

The purpose of this study is to recognise patterns and connections in the way we label and name objects within images, according to the demographic information we possess.

To collect data for this study, a web-based image labelling game called "Label It," will be built asking social actors to input their demographic information and five words they believe best describes the content of an image.

This data will be saved in a relational database to facilitate subsequent processing. The database will be mined using a variety of statistical measures such as correlation, mutual information, etc. Labels will be explored using methods such as clustering, latent semantic analysis etc. to identify synonymy, homonymy and hyponymy or - in general - related labels. The results will be curated manually and organised into a taxonomy – defining and naming groups of objects that share the same characteristics. A formal definition similar to a dictionary entry will be given to each node in the taxonomy. The associated vocabulary will include all varieties in the jargon and lingo across different user groups.

Visualisation of the results from this study will be displayed in graph form and the labels within the taxonomy will be visually shown within tag clouds.

The outcomes of this study hope to answer the following statements:

Are there any patterns that occur when individuals:

- Of different genders label images?
- Of different ages label images?
- Of different nationalities label images?
- Of different ethnic groups label images?
- Who speak different languages label images?
- Of different levels of education label images?
- Of different religions label images?

The images required for this study will be chosen at random and must contain objects that are open to interpretation. This will result in a larger variety of responses.

From these images, a vast scope of tags is predicted to be generated. These tags can be one or more words long and can describe any object, content or colour within the image.

2. **Background research**

2.1. Games with a purpose (GWAP)

We continuously tag and label objects. Whether this involves tagging a friend in a Facebook photo or labelling a piece of paper with a post it note in a home filing system, we tag to specify explicitly what or who the content of that object is about. Focusing in particular on picture labelling, the Internet contains an unjustifiable amount of images as it changes every second.

This raises the question, how does a search engine such as Google Images find an image on the web if it has no related semantic information?

(Saini. 2008) As a general rule, computers do not understand images.

(Ahn v. L. 2009) Web based applications that connect content sharing and gaming elements, otherwise known as human based computation games or GWAP, have recently increased in popularity where content is created and shared through gameplay. This human based computation technique is where a computational process performs a function by outsourcing tasks to humans in an entertaining way.

(Ahn v. L, 2009) An example of a popular GWAP is the ESP game. Two unrelated players are tasked to create accurate matching keywords to randomly generated images within a given time limit. Points are earned when both keywords match. Whilst players enjoy the game, the matching keywords are used as tags for the image. Repeating the same image with other pairs of players, the computer eventually builds up a detail label. The creator of the ESP game, Professor von Ahn claims that if it were as popular as other online games, all the images on the web would be labelled in a matter of weeks. Figures 1, 2, 3 and 4 (Appendix) shows the interface of the ESP game, being matched up with a random participant, entering words that best describe the image and what happens when both words match.

(Schwartz. 2006) Another online tool which followed the exact entertainment method as the ESP game was the Google image labeller, which became non-existent in 2011. It followed the same rules, where two opponents had to match their image labels to be able to move on to another image. With the same intention as the ESP game, human powered efforts would tag or label images in able to improve the performance of image search engines and increase accessibility for visually impaired users who would read out the image labels.

(Daily Mail. 2008) The world famous social media site Facebook recently released their new tool that helps people tag photos on the Web by figuring out who is in the pictures. Facebook uses the technology to scan a user's newly uploaded photos, compares faces in the snapshots with previous pictures, then tries to match faces and suggest name tags. When a match is found, Facebook alerts the person uploading the photos and invites them to 'tag,' or identify, the person in the photo.

(Saini. 2008) A social actor searches for an image of an apple on the Internet would only find

it if it had been correctly labelled with the tag 'apple,' possibly including the word 'mac' or 'fruit'.

Games such as the ESP game or Facebook's face recognition may improve web searches and decrease tagging time, although it does not answer the question; does our demographic information play a role in the way we see things and if so, how?

2.2.   Perception

(Heer et al. 2005) Perception is defined as being our ability to achieve an understanding of something, using our senses such as our sight or hearing.

Our vision is potentially the most important sense that we possess.

2.3.   Perspectives

(Vivyan. 2009) The word perspective is defined as being our view or outlook. The probably familiar image of Figure 1 (Appendix 1) of two faces or a candlestick shows us that things are not often what they first seem and that there is always a different perspective.

According to our belief system, we give different meanings to every conversation, situation, and event or in this case, Figure 1 (Appendix 1), meaning something different to everyone. We subconsciously try to make sense of this world by forming judgments and opinions about every situation, event, interaction and sense according to our own past experiences, our culture, faith or beliefs, the communities we are from and our upbringing.

2.4.   How is our perspective affected?

(Heer et al. 2005) Culture can be defined in many ways. Its most popular definition seems to be that is it the way of life of a given society. It includes the way people think, act and interact with each other and the way we make decisions. It can also define what an individual might eat, what they wear and what they think is right or wrong. Cultures are passed down from one generation to another and what we learn from our parents or guardians and the individuals who also taught them, is passed down to us.

Our culture influences the way we see and perceive things within the world. The way we perceive the world, otherwise known as our worldview, differs from the way other people from different cultures perceive it, leading to us all having different worldviews.

2.5.   How gender affects our vision

(Glynn. 2012) According to a new study published in Biomedicine, the journal Biology of Sex Differences suggests that men and women differ when it comes to vision. While females are better at distinguishing colours, experts suggest that males are more sensitive to fine detail

and rapidly moving objects.

A study was carried out by a team of researchers from Brooklyn and Hunter Colleges of the City University of New York, where experts observed participants over the age of 16. This study proves that the male's colour vision was shifted when they asked them to describe colours that were presented to them across the visual spectrum. It was also clear, that male participants needed slightly more time to experience the same hue as the female participants.

Another experiment was conducted where the participants were asked which they saw from light and dark horizontal bars. When these bars were alternated in each image it appeared to flicker. Researchers found that by varying the speed of the bars alternated and the space between them, the participants would lose all concept of how close the bars were to each other but gained sensitivity when they were further apart. The male participants had an easier time reliving the rapidly changing images that had bars closer to each other.

2.6.   How age affects our vision

(Heiting. 2010) Just like physical strength, our eyesight also decreases with age.

Some age related eye changes such as cataracts or presbyopia: individuals who experience blurred near vision when performing activities, are perfectly normal as we get older. While we normally think that aging conditions affects our vision, more subtle changes and eye structures also take place as we grow. These include reduced pupil size which affects the response of the pupil to changes in lighting, dry eyes, a loss of peripheral vision and colour vision.

2.7.   How ethnicity affects our vision

(Glaser. 2012.) As technology continues to grow, differences and patterns between ethnicity, nationality and culture emerge. Each of these attributes in our life affects our health, well-being and general mind sets. Studies exist that have found correlation between children's ethnicity and vision issues. There are other factors that affect our eyesight such as diet, family history and age which are a part of one's culture and nationality.

It is not only our physical aspects that affect the way we see, but also our experiences and perception. This links us back to our cultures and perspectives. As we get older, we gain much more experience. We know that a table is called a table from an early age, as we have been taught by our parents and guardians.

An individual over the age of 60 could look at an image which was blurred or fuzzy and not be able to recognise the object as their eyesight is not as clear as a younger individual's is. Although, the same individual could not recognise an object within an image such as an iPhone, as they have never experienced using it and therefore are unclear of what it is.

3. **Data collection method**

In order to conduct this study, a sufficient amount of data needs to be collected to be analysed. There are many ways that could be used to collect data, although this report focuses in particular on Survey Monkey, Google's Google Docs platform and a web based image labeller.

3.1. Survey Monkey

(Survey Monkey. 2009) Survey Monkey is an online questionnaire and survey tool. It is free, easy to use and does not require any hosting as it already exists on the web.

I conducted a short questionnaire using one image using Survey Monkey and asked two social actors to participate quickly in testing the functionality of this tool. Figure 1 and 2 (Appendix 2) show how the questionnaire looks using the Google Chrome browser. It is simple and clear for the participant to use.

Figure 3 (Appendix 2) displays a summary of the results.

Figures 4 and 5 (Appendix 2) show the results from one participant. This is unclear as the answers to both questions are not on the same page and therefore is visually confusing to see what labels belong to which social actors.

Its main limitation is the question types available. Having five text boxes for each image would be the most appropriate as it separates the image labels from each other. Figure 5 (Appendix 2) shows that the participant has only entered two words to describe the image. A validation feature would be useful in forcing the user to insert 5 labels within the text box.

An upgrade is required to be able to use the text analysis function which costs £299 a year. Without the upgrade, Survey Monkey summarizes the responses by displaying how many people participated and their answers to the survey.

Data from Survey Monkey can be filtered. Its filter feature is useful for tasks such as if you want to know the differences between for example employee satisfactions within different departments. You can ask participants the same question where they select a department, but the filter can see if people in one department are more satisfied than the people in another.

You can also export data from Survey Monkey to a Microsoft Office Excel document.

To finish, it provides an easy GUI interface for the purpose of this study although there is the limitation of not being able to provide five separate text boxes for each limit each question. The display of the responses is not suitable for this study as analysis cannot be performed on the data without having to export the data and move it to a database, which is inefficient and could lead to complications.

3.2.   Google forms and spread sheet

(Silverman. 2008) Google recently added a feature to its Google Docs platform, called Google forms, a flexible form and survey development interface with built in reporting. It works by adding a form to the Google spread sheet, where you can design your questions, their types and the theme of the form interface. Once the question is answered by the social actor, the data is saved to the spread sheet that is saved to your Google Drive, Google's cloud storage space.

Google's Forms and Spread sheet is that it is free and easily accessible. Its spread sheet does have a limit of 400,000 cells, with a maximum of 256 columns per sheet.

To test if Google's platform was suitable for this study, I built a basic form containing 2 questions. Figure 1 (Appendix 3) shows the interface to build the form with and Figure 2 (Appendix 3) shows what the user would see if they were to participate. Figure 3 (Appendix 3) displays the spread sheet. Its functionalities at first were positive. It had ready-made themes available which you could edit to you preference, it could facilitate the amount of questions for this study and a variety of question types.

You can export data from Google's spread sheet by using the Google Spread Sheet API. Also, the filter feature by Google lets you choose which data you want visible in the spread sheet. Figure 4 (Appendix 3) shows that the data within the spread sheet has been filtered to display male participants only.

Within Google spread sheet is the chart feature. From the spread sheet, you are able to choose what cells from the spread sheet you want to graph and what graphing method. Figure 5 and 6 (Appendix 3) show two different graph types, with Figure 7 (Appendix 3) proving how you can style your graph to your preference.

Its only limitation and a considerable one for this study, is that an image could not be added to a form.

To overcome this, the source code for the page was available, allowing me to copy and paste the HTML, CSS and Javascript for the form to an HTML file of my own. From here, I could add my own images to the file and still maintain the functionality of saving the data to the Google spread sheet. A limitation of using this method is that I would need hosting rather than to use Google which is obviously already hosted.

Another limitation that arose with this method is that you could not connect more than one form to a spread sheet. I came across this when I attempted to insert the source code of two different questions from one Google form into two different HTML files. What needs to be remembered here is that this is a spread sheet and not a database, although Google have introduced an SQL query functions such as inserts, updates and deletes. However, connecting two spread sheets is a complicated task.   Therefore, if I were to use Google's form it must be on one page. I personally believe that this is not very efficient when it comes to usability as not many websites are one page long where you must continuously scroll down to the next question.

All in all, Google's form and spread sheet would be perfect for this study if it did not have the limitation of not being able to insert an image with the question and that more than one form could be used for a spread sheet.

3.3. Web based image labeller

Due to the limitations of Google and Survey Monkey, it was decided that a custom built web based image labeller would be more appropriate to collect data for this study.

Building a web based data collector using simple web languages and tools would eliminate the limitation that Google and Survey Monkey have. There is no issue in including five text boxes for each image label or having an image included.   Another benefit of building a web page for data collecting is that the data can be stored instantly to a database without having to move it after exportation.

Although, by eliminating these limitations others can occur. This task can be time consuming as it must be designed; tested, different web tools must be researched into etc.

Given the time, the web page would have to be as simple as possible as building it is not the main focus of this study.

The tools that will be used to build this data collector will be HTML, CSS, PHP and JavaScript. HTML and CSS will be used to display and style the webpage. PHP and JavaScript will be used to connect and save entries to the database and to produce error messages when a user submits empty entries.

The relational database has been decided upon is MySQL using the PHPMyAdmin graphical administration application. Compared to Microsoft Access, it is more suitable for this study as it is a web application and more secure.

Cardiff University's School of Computer Science and Informatics student and staff users web server was chosen to host the website, as it is free, available without password restrictions and easy to upload files to.

In order to prototype the design the potential functionalities, features and usability of this web labeller, the software Microsoft Office PowerPoint has been chosen purely on the reason that it does not need to be downloaded as its available within the Office suite.

For this study, as its aims are to answer the statements within the introduction of this report, the demographics gender, age, ethnic origin, native language, education attainment and religion will be needed.

3.4.   Summary of features

Feature	Survey Monkey	Google form	Web based image labeller
Images can be inserted	✓		✓
No limitation to having five text boxes per image		✓	✓
No limitation to the number of questions that can be asked		✓	✓
Themes available to reduces building time	✓	✓	
Data can be saved straight to a database			✓
Data can be exported to an Excel spread sheet	✓	✓	✓ (from database)
Does not need hosting	✓	✓	

4.	**Design**

As the data collection for this study is not the main objective and because of the simplicity of the web labeller, there will be no use case diagrams.

4.1.	Tools

4.1.1.	WordPress

WordPress is a free and open source blogging tool and a content management system based on PHP and MySQL. It has many features including a plug-in architecture and a template system. It uses a theme which allows the users to change the look and functionality of the website.

(WordPress. 2012) WP contact form is a WordPress plugin which would allow the social actor to input their demographic information and image labels. Once the participant submits a response, the data is emailed to you. You can also manage responses in the feedback management section of your WordPress account. There are also plugins for exporting data to the WordPress database.

4.1.2.	HTML

(w3schools, 2012) Mark-up languages use tags (or labels) certain parts of the document to indicate what they are and how they should be formatted. A pair of tags plus their content constitute and element e.g. <title>Hello world</title>.

Hyper Text Mark-up Language (HTML) is a mark-up language, emphasising primarily on structure. HTML is built with HTML tags and plain text, creating a HTML document otherwise called a web page.

4.1.3.	CSS

(w3schools, 2012) You cannot use HTML to structure a web page without CSS. Cascading Style Sheets (CSS) have been designed to define how to display HTML elements and to control the presentation and appearance of web page content. It decreases the repetition of code. Style sheets can be internal or external to the HTML document and multiple style sheets can be included.

4.1.4.	PHP

(w3schools, 2012) HTML and CSS mostly prove to be static. Scripting languages provide more dynamic web pages in which the content of a particular page changes in response to the user action or request. Hypertext Pre-Processor (PHP) is an example of a scripting

language that is executed on a server. It supports many databases with MySQL and Oracle being the most popular.

4.1.5. JavaScript

(w3schools, 2012) JavaScript is a programming code that can be inserted into HTML pages. It can be used to validate inputs. The alert() function is not much used in JavaScript, but will be used for this study to alert the user that they have tried to submit less than 5 labels for an image.

4.1.6. AJAX

(w3schools, 2012) Asynchronous JavaScript and XHTML (AJAX) is about updating parts of a web page, without reloading the whole page, increasing speed and dynamicity. AJAX allows web pages to be updated asynchronously by exchanging small amounts of data with the server behind the scenes.

4.1.7. jQuery

(w3schools, 2012) jQuery is the most extendable JavaScript framework that makes it much easier to use on a website. It takes a lot of common tasks that requires many lines of JavaScript code to accomplish, and wraps it into methods that you can call with a single line of code.

4.2.   **Database**

4.2.1. SQL

(w3schools, 2012) Structured Query Language (SQL) is the standard language for accessing and manipulating databases. It can input and retrieve data to and from a database, update and delete data within a database, create new databases and execute queries against a database.

For SQL to work the following is needed; a relational database management system (RDBMS) such as MySQL or MS Access, a server sided script language such as PHP, SQL, HTML and CSS.

4.2.2. Relational database management system (RDBMS)

(Lesson 5, College of Information Science and Technology 2008, para.9) Data in relational databases are stored in different tables, each containing a key field that uniquely identifies each row. The relational database has become quite popular for two major reasons; they can be used with little or no training and database entries can be modified without redefining the entire structure. The power of the relational database is to bring data together quickly.

(MySQL) An example of an RDMS is MySQL.   MySQL is the world's most used open source RDMS available and it is a popular choice of database for use in web application. A well-known graphical administration application that integrates with MySQL is PHPMyAdmin and MySQL Workbench. MySQL's rich features in manipulating, securing and managing data makes it popular within the database world.

(Microsoft. 2012) Another example of a RDMS is Microsoft Access which is a relational database tool and a part of the Microsoft Office suite. It uses forms which are the primary interface through which the users of the database enter data. Microsoft Access database query language is SQL. Access's limitation is that it has a file limit size of 2GB.   Microsoft Access is unpopular to use when saving data to from a web page as it is more suitable for desktop use with a small amount of users using it simultaneously.   A reason to choose Access over SQL's server is its compatibility and sharing. For example if you wanted to email Access to someone, they would most probably have it on their desktop rather than SQL server. Another reason to choose Access over SQL is its cost. Access is a part of the Microsoft Office suite and purchasing SQL server would be expensive. Its security is limited to only requiring a username and password to access it.

4.2.2. Summary of features

Feature	MySQL - PHPMyAdmin	Microsoft Office Access
Query language is SQL	✓	✓
Database of choice for use in web application	✓	
Database of choice for desktop use		✓
2GB file size limit		✓
4GB file size limit	✓	
Considered as not being secure		✓

5.   **Web hosting**

A web hosting package is a place to store your website. The hosting server stores the entire files that are used to build your website, such as HTML, PHP and CSS files. This enables Internet users to access the files and read your website.

There are many possible hosting methods available, although the following in particular are what are considered to be used.

5.1   Cardiff University's School of Computer Science and Informatics student and staff users web server

(Evans. R. 2012) Students in Cardiff University's School of Computer Science and Informatics can create and publish a web site on the users web server http://users.cs.cf.ac.uk/. Publishing on the users web site is a privilege offered to users within the school. Pages on the users server are visible to the whole Internet.

5.2.   Cardiff University's School of Computer Science and Informatics Project web server

(Evans. R. 2012) The site is visible within the School's Intranet only. In practice, this means that you can see your Project web site from any computer in Cardiff School of Computer Science and Informatics. If you try to access the site from a remote computer, the browser will be redirected to use https protocols and you will be prompted for your username and password.

5.3.   Free hosting cloud

(FreeHostingCloud) This is a free website hosting service. Anyone who has a website or intends on starting a website can sign up for free to host a website of any kind that follows the free hosting cloud terms and conditions.

5.4.   Summary of features

Feature	Cardiff University's users server	Cardiff University's project server	Free hosting cloud
Free	✓	✓	✓
Must be a student of Cardiff University to have access to the server	✓	✓	
Any user has access to the web page	✓	Needs password and username as it runs on the intranet.	✓
Can upload files through an online file management application	✓	✓	✓
Can upload files using an FTP such as WinSCP	✓	✓	✓

6. **Image collection**

6.1. How did the ESP game choose images?

The most basic strategy for picking the images is to select them at random from the Web using a small amount of filtering. This is the strategy employed in the current implementation of the ESP game. Once an image is randomly chosen from the Web, it is reintroduced into the game several times until it is fully labelled.

The images were chosen using "Random Bounce Me", a website that selects a page at random from the Google database. "Random Bounce Me" was queried repeatedly, each time collecting all JPEG and GIF images in the random page, except for images that did not fit the ESP criteria: blank images, images that consist of a single colour, images that are smaller than 20 pixels on either dimension, and images with an aspect ratio greater than 4.5 or smaller than 1/4.5. This process was repeated until 350,000 images were collected. The images were then rescaled to fit the game applet. 15 different images from the 350,000 are chosen for each session of the game.

The images that are required for this study need to be busy and colourful to challenge the participants as they will have a range of objects to label.

6.2. Photo.net

There are many random image generators available online. The website photo.net allows you to choose a random image under a category of your choice. By running through a couple of images, they seem to not fully match with the specified category. Sifting through random images until a suitable one appears might be time consuming.

6.3. Using a digital camera

Another possible method of collecting images is to take photos with a digital camera. This will limit any copyright issues. Although, finding an photograph challenging enough or relevant to this study might be time consuming.

6.4. Summary of features

Feature	Photo.net	Using a digital camera
Free	✓	✓
Avoids copyright issues	Not fully	✓
Time consuming	✓	✓

The image collection method has yet to be fully decided. Although, as sorting through random images available online it may be best to use Photo.net or another online random image generator.

7. Demographic information

Demographic information is the characteristics that we as humans possess. Commonly examined demographics include gender, age, ethnicity, knowledge of languages, disabilities, mobility, sexuality, employment status, location etc. Demographics are usually used in media to classify an audience into different categories.
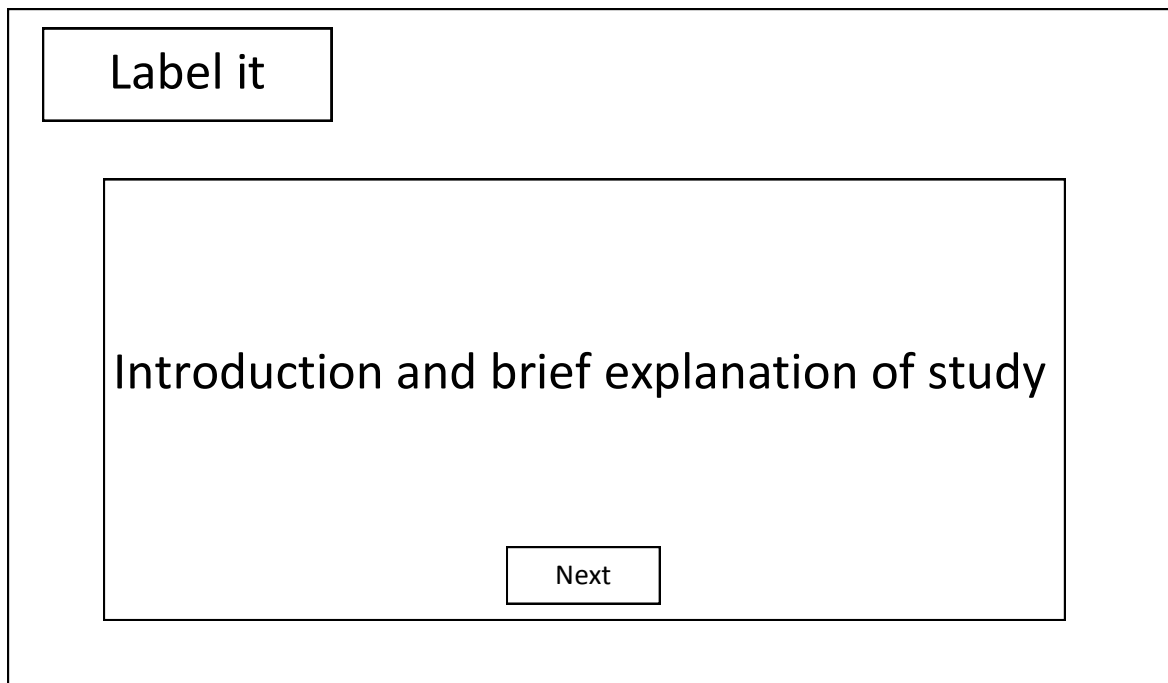
Many more statements could have been presented such as do any patterns occur when individuals of different sexualities label images? This statement in particular would entail having to ask the participant what is their sexuality or sexual preference. This question would be too personal to ask as to some it is socially private and I predict there would be a lack of responses to run analysis on.

8. Data protection act

(Cardiff University. 2010) In order to make sure that this study adhered to the data protection act in relation to storing personal data, Cardiff University's ethic guidelines were revised. It became irrelevant as although personal data is to be stored, there is no way that this data could identify the participant of the study.
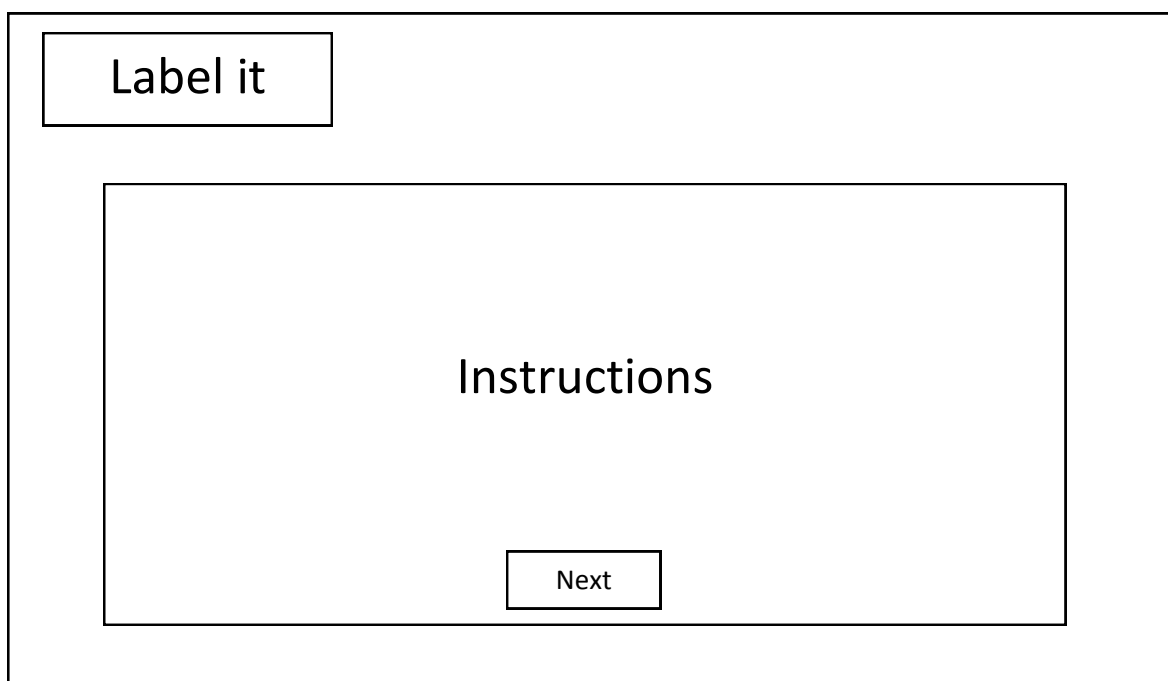
9.   **Interface design**

This page will welcome the participant to the web site. A brief introduction to the project will be given, along with an instruction to press the "Next" button which will guide the user to the "Instructions" page.

```
┌─────────────────────────────────────────────────────────┐
│  ┌──────────────────────┐                               │
│  │  Label it            │                               │
│  └──────────────────────┘                               │
│      ┌──────────────────────────────────────────────┐   │
│      │                                              │   │
│      │                                              │   │
│      │  Introduction and brief explanation of study │   │
│      │                                              │   │
│      │              ┌──────────┐                    │   │
│      │              │   Next   │                    │   │
│      │              └──────────┘                    │   │
│      └──────────────────────────────────────────────┘   │
└─────────────────────────────────────────────────────────┘
```

The instructions page will explain to the participant what is required of them which is to select their demographic information applicable to them on the following page and enter five things that they see within the image. This will be written in bullet point form and important instructions will be put in bold text to emphasize.

```
┌─────────────────────────────────────────────────────────┐
│  ┌──────────────────────┐                               │
│  │  Label it            │                               │
│  └──────────────────────┘                               │
│      ┌──────────────────────────────────────────────┐   │
│      │                                              │   │
│      │                                              │   │
│      │                 Instructions                 │   │
│      │                                              │   │
│      │              ┌──────────┐                    │   │
│      │              │   Next   │                    │   │
│      │              └──────────┘                    │   │
│      └──────────────────────────────────────────────┘   │
└─────────────────────────────────────────────────────────┘
```

This is the demographic information page where the participant is asked to select the information applicable to them from the drop down boxes provided.

Label it

Your information

Age:

Gender:

Nationality:

Native language:

Highest academic qualification to date:

Religious belief:

Next

Each page containing the images will have the same design. They will have the image on the right hand side and the text boxes to enter the label in and "Next" button will be on the left.

Label it

What do you see?

Label

Label

Label

Label

Label

Next image

Image

To conclude, the user will be thanked for their participation and encouraged to share the URL for the website.

Label it

Thank-you for participating!

10.   Prototyping

The prototype has been uploaded to the Archive file.

There are many free prototyping tools available on the Internet to download such as ProtoShare. (ProtoShare. 2012) ProtoShare enables you to quickly create simple interactive project prototypes and to gather valuable feedback on your design. (Figure 1, Appendix 4)
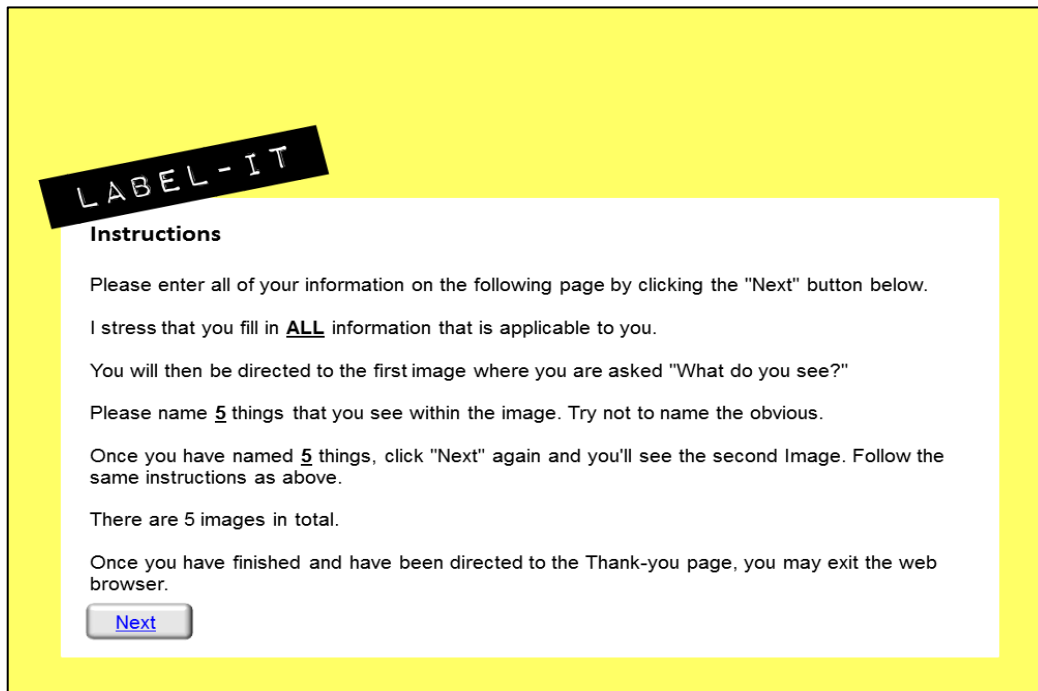
(Kelly. 2007) However, the most surprising piece of software that is used to create prototypes is Microsoft Office PowerPoint. The main reason that PowerPoint is used for prototyping is that it is fast; you can trial and error quickly.

Its basic interactivity allows you to use each slide as a separate page of your website or application. You can use basic shapes, text and clipart to populate the screens. Once your basic mock up is complete, you can add hyperlinks to text, shapes and images. Hyperlinking lets you link different slides to each other, which simulates the flow of how your application or website will work.

This is the welcome page. The "Next" button is hyperlinked to take the user to the instructions page. It includes an introduction to the project and the instructions for the participant are in bold text to guide them through this process.
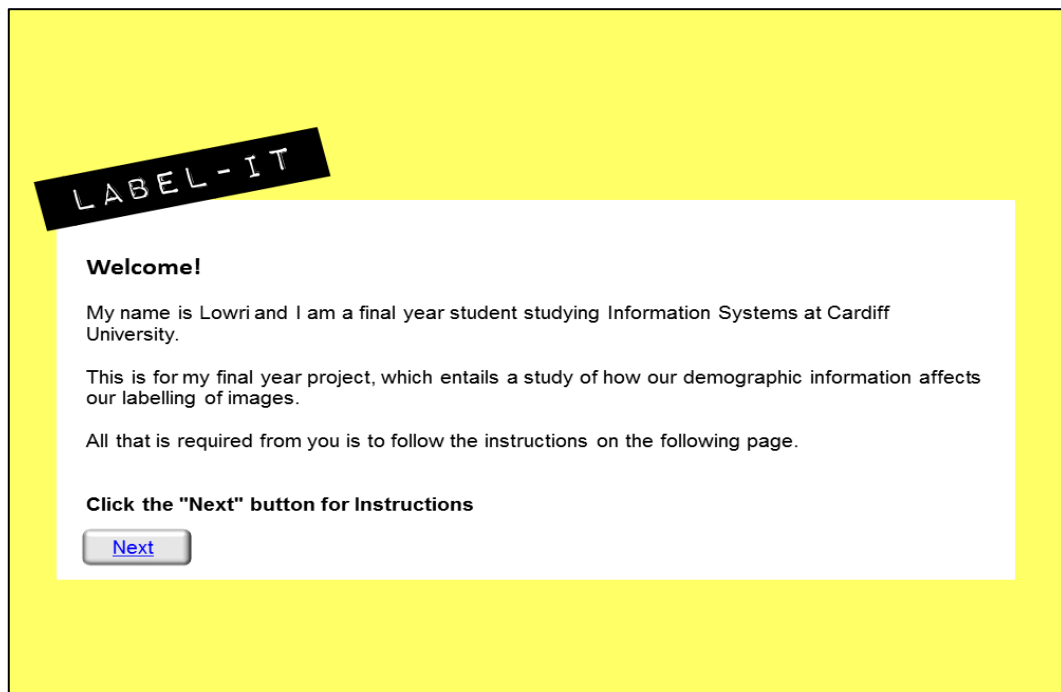
When the user has clicked the "Next" button, they are guided to the Instructions page. This page includes simple instructions to guide the participant. Important information that needs to remember such as how many images are included within the website has the bold and underline text format to emphasize its importance. The user clicks on the "Next" button.

LABEL-IT

Instructions

Please enter all of your information on the following page by clicking the "Next" button below.

I stress that you fill in **ALL** information that is applicable to you.

You will then be directed to the first image where you are asked "What do you see?"

Please name 5 things that you see within the image. Try not to name the obvious.
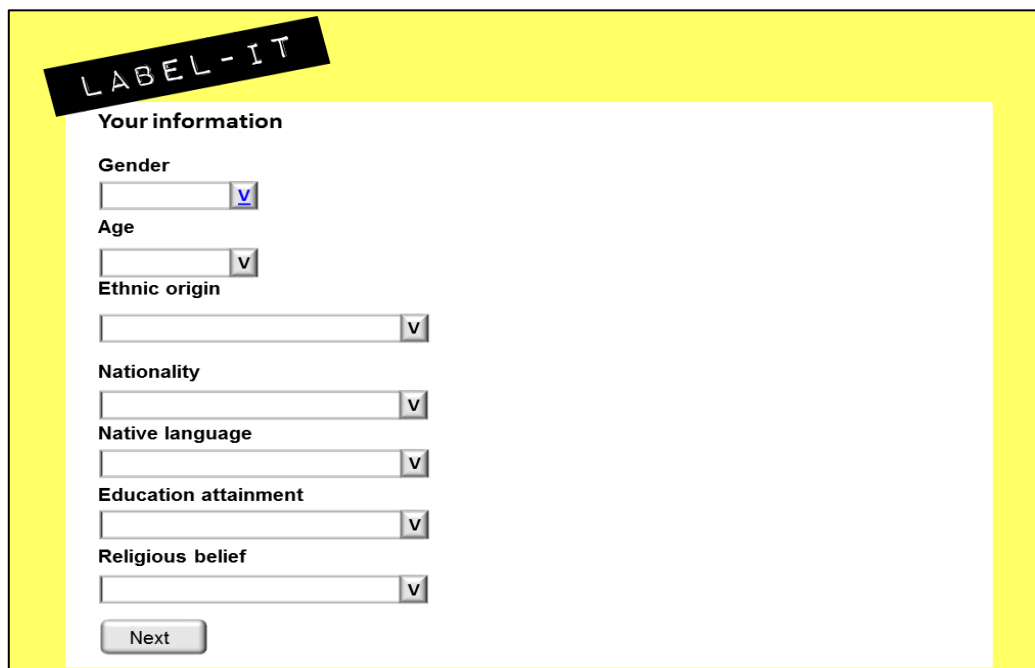
Once you have named 5 things, click "Next" again and you'll see the second Image. Follow the same instructions as above.

There are 5 images in total.

Once you have finished and have been directed to the Thank-you page, you may exit the web browser.

Next

The demographic information page includes 7 drop down menus.

LABEL-IT

Your information

Gender

Age

Ethnic origin
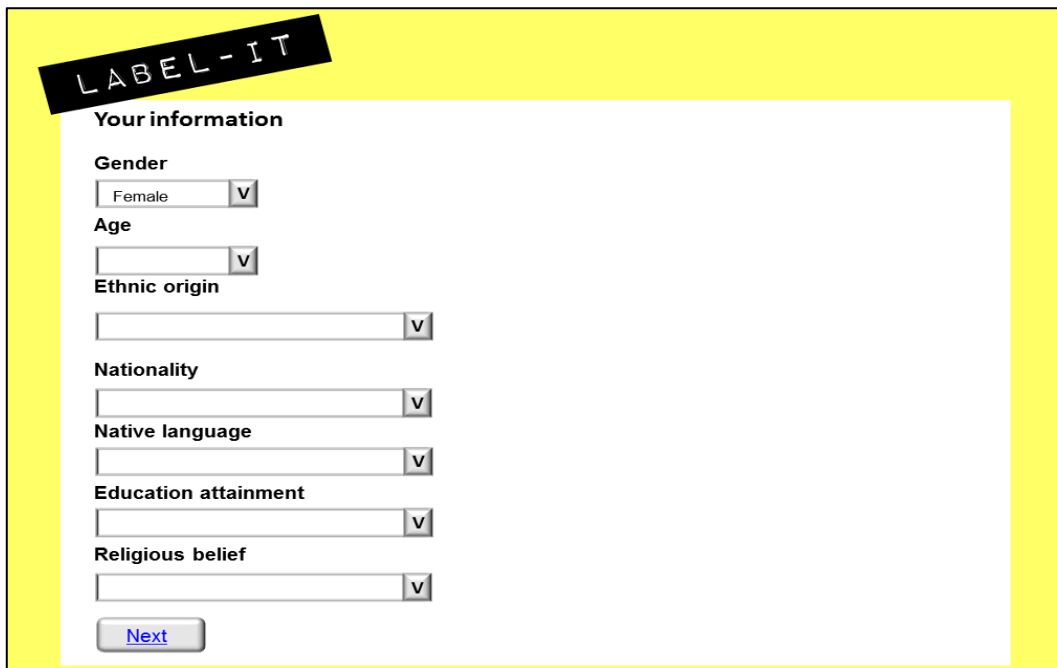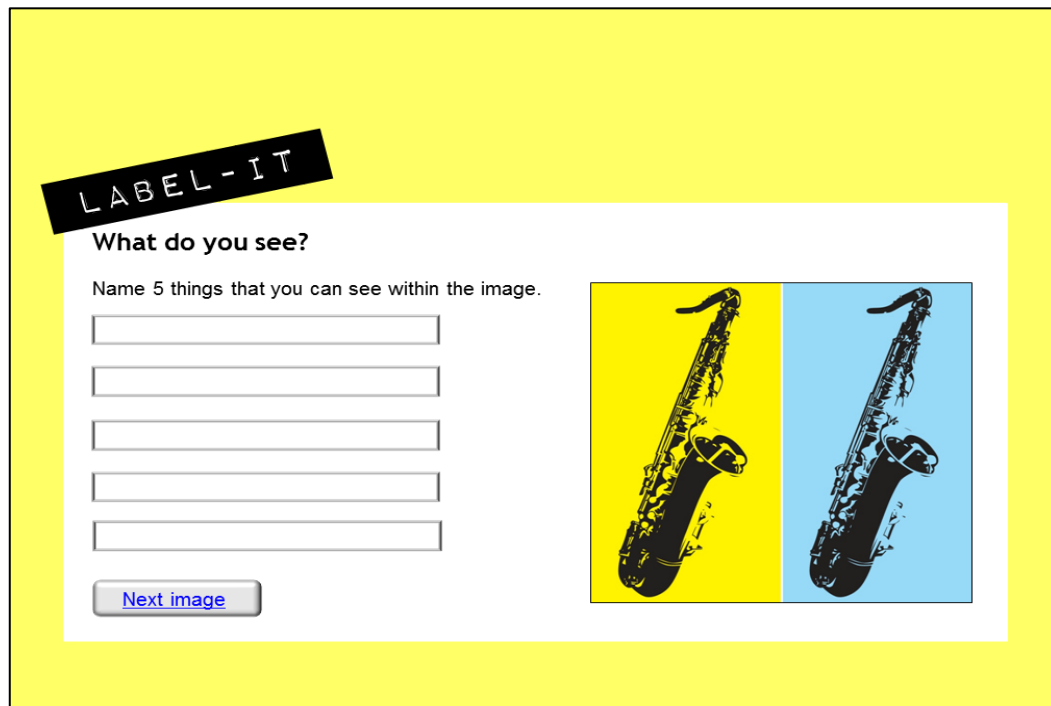
Nationality

Native language

Education attainment

Religious belief

Next

Using the gender drop down menu as an example, the user would press on the arrow which will display a list of gender types which are male and female.

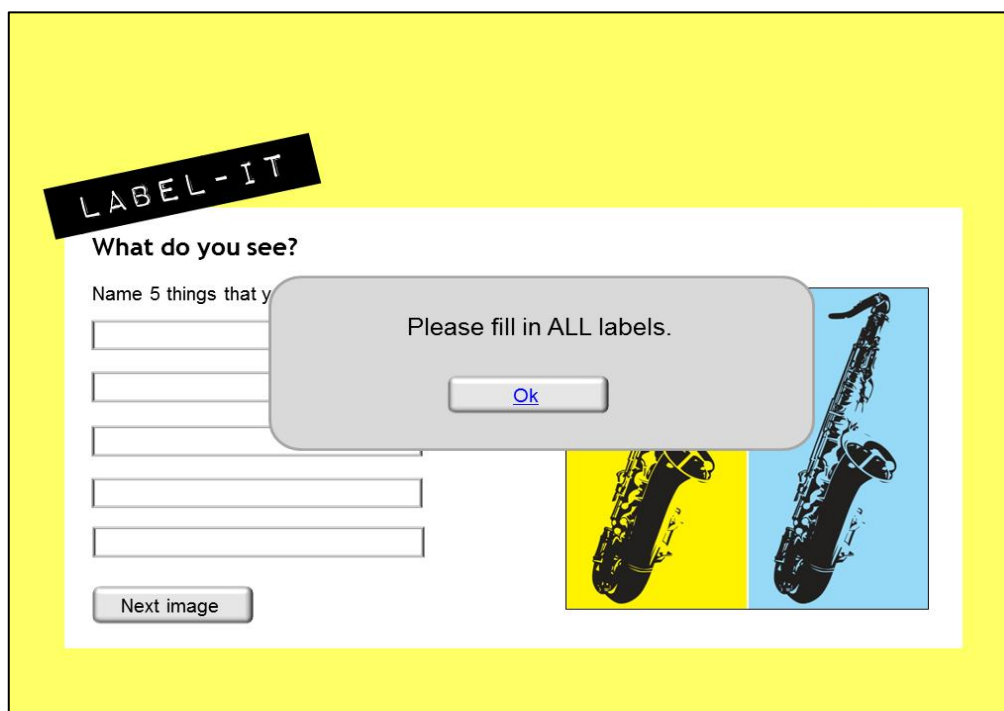The participant clicks which gender category they belong to which will then be visible within the text box of the list.

After the participant finishes selecting which gender, age, ethnic origin, nationality, native language, education attainment and religion category they belong to, they press the "Next" button which will guide them to the first image. For the purpose of this prototype, a random image was chosen from Google images. Each image will have the following design.

If the participant submits without entering any labels, the following error message will be visible.

If the participant attempts to submit 4 labels rather than 5, the same error message will be visible.

Once the participant has inputted 5 labels and has pressed the submit button, they are directed to the next image. For the purpose of this prototype, they are directed to the Thank-you page.

LABEL-IT

Thank-you!

Thank-you for spending your time participating in my study!

Please help distribute Label It by sending the URL to your friends.

You can do this by copying the link below.

http://users.cs.cf.ac.uk/L.Williams/Label_It/Welcome

11. Distribution of the image labeller

The Internet has made communication and connecting with people far much easier. Families and friends no longer stay in the same area, or the same country. They can be spread all over the world and still stay in touch. The Internet allows us to chat live via chat rooms or voice over internet protocol software such as Skype, share pictures, video and audio via email or social media sites such as Facebook, which is something phone calls and the post cannot compete with. The main focus here is the ability to share over social media sites. The openness of social media is increasingly extended where we are all open to feedback and participation. The distribution speed over a web page is immense. You can message and rope all of your Facebook friends into one message asking them to fill in a questionnaire for you in the matter of minutes and if they find it interesting, they can share this with their online friends who might also have an interest. Comparing this to real life, one to one communication, the difference is remarkable.

A prime example of how different using the Internet is to distribute rather than one to one human communication, is the Survey Monkey test performed and Tai Calon's experience.

Tai Calon, the largest housing organisation in Blaenau Gwent, South Wales, recently experienced the hard task of updating and validating just over 6000 tenant information. 4000 tenants were contacted via phone interviews that would roughly take five minutes, leaving 2000 tenants left to go and visit face to face to complete a questionnaire. To conclude, the information needed to be inputted into the database which resulted in data redundancy and integrity due to human error. Spending twenty five minutes filling in one questionnaire proved to be highly inefficient and very time consuming.

A test was conducted using Survey Monkey testing its functionality and also to prove how easy it was to distribute the URL to the questionnaire over Facebook. The URL for the questionnaire was shared with two social actors who were happy to participate, who received and completed the questionnaire in less than five minutes.

Compared to Tai Calon's struggle to collect data, this proves that social media's distribution speed and ease of access to audiences is far more suitable for this project rather than one to one communication with social actors. Not only this, the results of the questionnaires appeared and was stored in one place and could the data could be easily moved to a database to be able to query it efficiently. It would be time consuming and a waste of paper to have to go through paper based data.

12.   Database design

Image {Image_ID, Image_URL}

User {User_ID, Gender, Age, Ethnic_Origin, Nationality, Native_Language, Education_Attainment, Religion}

Labels {User_ID, Image_ID, Label}
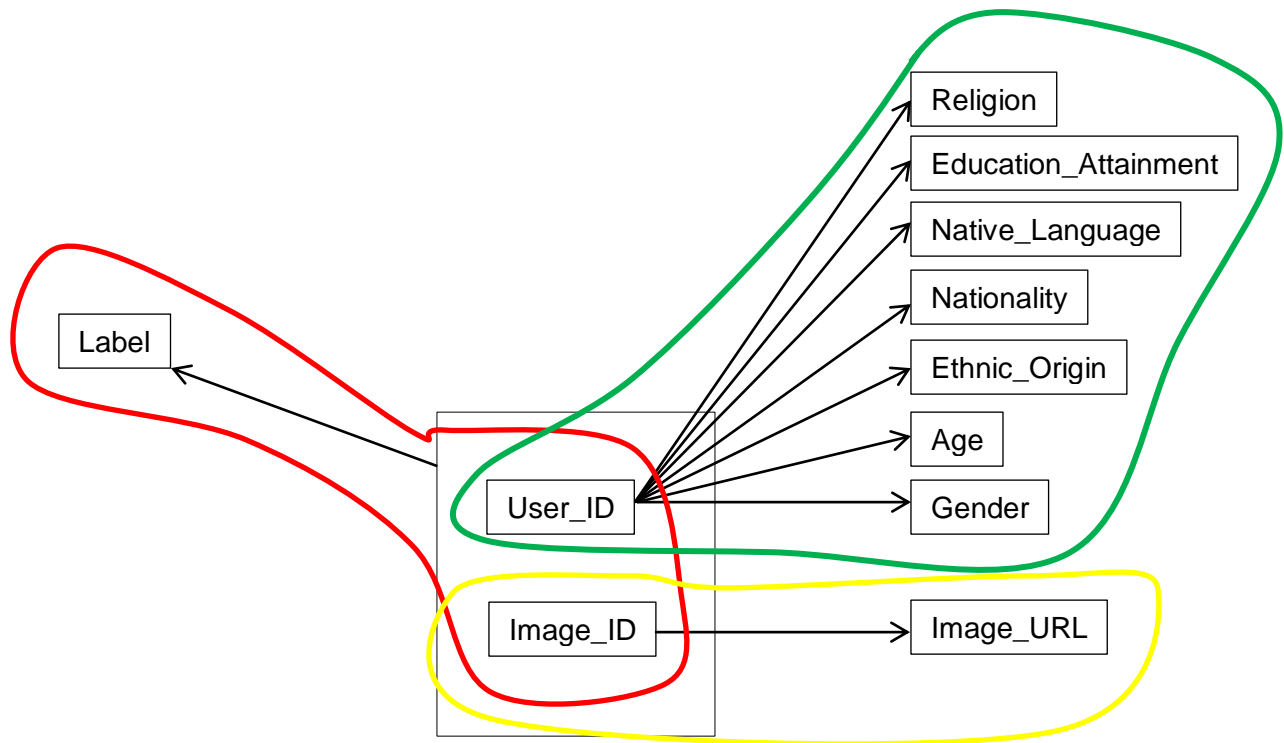
There will be three tables within this database. This design shows that a user is given an automatically generated unique ID, which will be stored along with their demographic information. An image is also given a unique ID which is stored with a URL to that image. The final table stores both user and image IDs along with a single label.

13.   Conclusion

To conclude, Label It is currently up and running on Cardiff University's users server. The tables within the database have also been created and are storing data from the web pages. Figures 1,2,3,4 and 7 (Appendix 5) shows the interface not including an image as of yet. Figure 5 and 6 (Appendix 5) proves that the validation method is working and that the participant must enter 5 labels before submitting. Figures 8 and 9 (Appendix 5) prove that entering demographic information will save to the database.

The next tasks are to link each table with the primary key and choose 5 images to be included within the website.

The project is currently on track and the distribution process will begin soon, resulting with data analysis and mining beginning in January after the examination period.

14.   **References**

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