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The Search For Favourite Places Using The “My Favourite Place” Web Application

A Geospatial Interpretation of Locations, Descriptions and
Activities

A thesis presented in partial fulfilment of the
requirements for the degree of
Master of Information Sciences (MInfSc)
in
Geoinformatics and User Interface Design
at Massey University, Albany Campus,
New Zealand.

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Abstract

In this study, data was collected through an online survey to find out people's favourite places in New Zealand and Wales. A web application called, "My Favourite Place", was designed and built with simple user interface design aspects and a Leaflet map in order to find favourite places. The website was launched on the worldwide web to generate interest from the public to participate in the survey. Participants were invited to complete one task of submitting the coordinates of their favourite places when using the embedded interactive map.

Three surveys were conducted. The first survey had 9 respondents who tested various user interface design aspects. The second and third surveys collected a total of 128 respondents who had submitted coordinates of their favourite places in New Zealand and Wales. The results of the first survey showed that people found the text colour red hard to read, the text colours blue and yellow easier to read, preferred using check boxes more than radio buttons, preferred blue font more than black font, and preferred red buttons more than black buttons. The results for the second survey of 114 respondents from New Zealand showed that people liked their favourite places because it was attractive, and because they enjoyed walking activities. The results of the third survey of 14 respondents from Wales showed that they valued attractive places, and its intrinsic values. Also, there were correlations of positive agreement for favourite places between the age groups of 40 to 49 year olds, and 50 to 59 year olds from New Zealand. Finally, the results of this study showed that a favourite place is often associated with sense of place values, activities, human relationships, beauty, and safety.

Keywords: Favourite Places, Space, Place, VGI, Map, User Interface Design, Sense of Place, Crowdsourcing, VGI Crowdsourcing, Tourism

Preface and Acknowledgements

The main focus of this study was to find out what kinds of places people valued and why. This focus included designing and building a web application that was launched on the worldwide web to collect data from the public. The study was limited to persons aged from 18 years and older. The coverage of this study focused on New Zealand and Wales. Delimiting the study to these two countries was to ensure that people's favourite places was relevant to a local audience specific to that country. Also, a comparison between New Zealand and Wales from the data collected would help determine any differences, similarities or disagreements of the kinds of places people valued, and to assess why people valued certain places more than others. Finally, an interest of extending the research outside of New Zealand was sought so that the web application could be used in another country to determine its usefulness in the study.

The study took place during the outbreak of the COVID-19 pandemic in New Zealand. On the 21st of March 2020, people living in New Zealand were informed of a new COVID-19 alert level system¹ introduced by the New Zealand Government. The alert level system comprised of four levels, 1 being with few restrictions and 4 being a total lockdown. The pilot study had just started on the 13th of March 2020, and it was agreed that the pilot study would continue in spite of the country being placed on level 2.

On the 25th of March 2020, New Zealand experienced its first level 4 lock-down period, preventing people from leaving their homes across New Zealand. Auckland city, the city where the research was being conducted in, was also affected by the pandemic. It was decided that the data collection process would continue throughout the COVID-19 outbreak. During this

¹ Covid-19 Alert System, *History of the COVID-19 Alert System* [website], <https://covid19.govt.nz/alert-system/history-of-the-covid-19-alert-system/>, (accessed 19 January 2021).

time, three surveys and a pilot study were conducted despite experiencing thirteen COVID-19 alert level changes ranging between levels 1 to 4 (see Appendix P).

Survey Two was conducted over a period of 5 months from the 6th of June 2020 to the 31st of December 2020. The total number of people who responded during this time was 114 respondents. Survey Three was conducted in Wales over a period of 4 months and 15 days from the 16th of September 2020 to the 31st of January 2021. The nature of conducting three surveys throughout the COVID-19 pandemic meant that the results from all three surveys were, at best, data collected during a historical period and is information presented “as is”.

The objectives achieved across three surveys required extensive web design, web development, coding, database design, web hosting, and web server management for 14 interfaces built by the author. Websites were launched on the worldwide domain for easier user reach nationwide across New Zealand and Wales. Behaviour by users were captured by Google Analytics in all surveys. Such painstaking endeavours could not have been achieved had it not been for the loving support, patience, encouragement, and cooperation of my partner, relatives, fellow students, friends, and the support of a wonderful supervisor, Dr. Kristin Stock.

During the study, there were key people that helped me tremendously, which I would like to acknowledge. Firstly, Dr. Kristin Stock’s contribution in this research who offered me an opportunity to explore her creation of the “My Favourite Place” concept. Dr. Kristin Stock possesses sound knowledge in place-based research, geoinformatics, and user interface design. It was a privilege working with her on this research project. Also too, her patience, forgiveness and understanding with the technological mishaps that occurred throughout the web development process was phenomenal. Dr. Kristin Stock’s supervision and support was outstanding, and her guidance helped me answer important research questions relating to geoinformatics, user interface design, VGI, crowdsourcing, and sense of place.

Secondly, I would also like to acknowledge the staff who approved three separate human ethics approvals pertinent to this study - approvals that were pivotal to conducting three surveys. Thirdly, I would like to thank the Welsh contact, Dr. Thora Tenbrink of Bangor University in Wales, who generously offered her time to share the website link with others in Wales. Fourthly, I would also like to acknowledge the I.T. staff at Massey University who maintained and backed up the Massey server hosting the web application. Fifthly, I would like to thank all the people who responded to the survey and provided valuable insights of their favourite places, their memories, and their stories.

It is my hope that I have made some academic contribution towards understanding people's sense of place in the context of *favourite* places. It was truly a rewarding study and a memorable journey that I will treasure for many years to come.

Best Wishes,

Johanna Richardson

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1 Introduction

Favourite places are places people like or prefer more than others (Korpela, 1992). Favourite places are known for their attractive landscapes, their natural surroundings, their green parks, recreational centres, natural areas and their activities (Sampson & Goodrich, 2009; Johnsen, 2013; Wilkie & Stavridou, 2013; Manzo, 2003; Rioux, Werner, Mokoukolo, & Brown, 2016; Rasmussen, 2004; Guerrero, Møller, Olafsson, & Snizek, 2016; Lecompte, Trelohan, Gentric, & Aquilina, 2017). Favourite places helps people feel better or happier when affected by hurt feelings, strained human relationships, medical illnesses, emotional turmoil, and the daily stresses in life (Korpela, 1992).

Favourite places are geometric spaces. Favourite places are associated with names and significant events. Space is often associated with place and are said to be connected, defining areas of life and existence. For example, buildings, parks, or regions of landscapes have spatial boundaries that define these areas as space (Lai, Lansley, Haworth, & Cheng, 2019). Place, on the other hand, is ever-changing. Place names change, re-zoning of areas change, even the physical landscapes experience change thereby affecting the meaning and the spatial dimensions of place. Key difference here, between space and place, is that space is symmetrical and measurable, whereas place is congruous and often linked to a place name and the activities people engage in while at that place.

Place-based research analyses activities, structural objects, natural and metropolitan environments, wildlife, marine life and other outstanding features such as its beauty (Jenkins, Croitoru, Crooks, & Stefanidis, 2016; Lai et al., 2019). Placed-based research also focuses on various disciplines such as sense of place (SOP), urban planning, geography, volunteered geographic information (VGI), crowdsourcing, place identity, place attachment, place dependence, and environmental psychology.

1.1 Background Study

Proshansky (1978) spoke of place identity as a relationship between landscapes and people. As people frequent familiar surroundings of a location, the location is meaningful to them and self-evaluations of their dreams, goals, and experiences are fulfilled. Place dependence is viewed as people's dependence on a place that provides sustenance to them (Sampson & Goodrich, 2009). Stedman (2002) described place dependency as being a "functional relationship" between the person and the place. Place attachment is when people bond to a place and its natural surroundings. Place identity, attachment, and dependence are usually merged to form the sense of place concept and is viewed as a primary discipline of place-based research.

1.2 Problem Statement

Previous studies of sense of place methods included recording the recreational activities people engaged in, asking questions about their background knowledge of places (Brown & Raymond, 2007), observing whether their sense of pride for a place is affected by natural disasters (Magee, Handmer, Neale, & Ladds, 2016), asking them about their ancestral links to place (Lecompte et al., 2017), their views on place dependence, place identity (Brown & Weber, 2012), and place attachment (Brown & Raymond, 2007).

There is also a growing interest in associating places to physical values (Kyle, Graefe, Manning, & Bacon, 2004), names, locations (Lai et al., 2019), culture (Stephenson, 2008), identity, dependence (Brown & Raymond, 2007), attachment (Kyle et al., 2004), genealogy (Stephenson, 2008), occupation (Sampson & Goodrich, 2009), and physical landscapes (Brown & Brabyn, 2012). However, while their studies described peoples' interaction with place, the locations observed were determined by the researcher and not necessarily by the respondents. Also, the locations discussed were generally predefined to the boundaries of usually the suburb, town, city of the researcher, or the respondents. This presents a problem when searching for

favourite places because the scope of the study is dependent on people sharing their favourite places, wherever it is. Therefore, predefined boundaries limit the scope of this study, preventing people from choosing a favourite place.

1.3 Thesis Statement

There have been many studies showing people's attachment to specific places such as the Otways region in Victoria, Australia (Brown & Raymond, 2007), Brittany, France (Lecompte et al., 2017), Westland, New Zealand (Sampson & Goodrich, 2009), Bannockburn, New Zealand (Stephenson, 2008), Camden, England (Lai et al., 2019), Akaroa, New Zealand (Stephenson, 2008), Kangaroo Islands, Australia (Brown & Raymond, 2007), and the Appalachian Trail in the United States of America (Kyle et al., 2004). However, these studies focused on places the researcher chose for its attractiveness or for its cultural values. For example, Sampson and Goodrich (2009) chose Westland, a place in the West Coast area of New Zealand known for its magnificent beauty, while Stephenson (2008) chose Akaroa because of the cultural values from that region.

Since researchers in place-based studies often chose a place of their preference, this thesis argues that *place selection* can be the respondent's choice rather than the researcher. This thesis also argues that extending place selection to everywhere, and anywhere, would allow greater freedom of expression by respondents. In this way, the study widens in scope and delimitations of towns and cities are removed.

1.4 Place Selection

Place selection is when a respondent selects a place of his or her own choice. This method is different compared to current sense of place methods. Traditionally, place-based researchers will usually choose a location and then ask locals to participate in the study. In this study, however, respondents were given the freedom to choose a place anywhere within the geographic boundaries of New Zealand or Wales, that they would consider to be a favourite

place at any time throughout their lifetime. Place selection is significant, because when people are given the opportunity to choose their favourite place anywhere within the boundaries of a specified country, people are more inclined to select a favourite place they value, prefer, or like more than others.

1.5 Place-Based Research

There is an abundance of research studies in the topic area of sense of place, and the relationships that exists between places-to-people (Manzo, 2003), and people-to-places (Rollero & De Piccoli, 2010). However, research on favourite places and adults, and the relationships between places-to-people or people-to-places in the context of favourite places, are still lacking. Korpela (1992) asserts that researchers still do not quite know why people choose different types of environments as their favourite place, their reasons for going to a favourite place, and why they prefer a location more than others.

Place-based research also highlights the need for local government, councils, the public, and other key stakeholders to be aware of places affected by delineation, urban redevelopment, and global climate change. Government and local agencies should ensure that coastal, urban, mountainous, or forests areas are managed properly. Policymakers can make thoughtful decisions about the community and landscapes, as they consider people's sense of place values during urban planning, or while managing local tourism. And finally, at an human level, people need to be educated on how spaces and favourite places can be managed correctly.

Important questions are raised by those engaging in place-based research such as: How do people feel about places when it is a favourite place? An unsafe place? Or a place affected by landscape changes? The descriptions of favourite, unsafe, or disaster-struck places might change people's sense of place. Therefore, these questions and many other questions will be answered throughout this thesis. While the descriptions of place differ in a variety of contexts, the study will be focusing mainly on people's view of favourite places.

1.6 Gaps in Place-Based Research

Place-based research studies often ask participants their views of a specific city or town by creating statements called place statements. Place statements are associated with sense of place values. Values refer to an aspect of the place such as its landscape value, its attractive value, spiritual value, and so forth. Place statements are used to measure the value of places by first providing a statement about the place value, and then asking respondents to measure the place value on a Likert scale.

Asking the participant to write their views of their favourite place would also reveal other insights, since place statements are more focused on finding out the landscape value rather than finding out what or why a place is special or favourite to them. Various approaches towards finding favourite places has raised interesting points about place-based research and hence gaps can be found, such as:

- Place statements do not necessarily provide an opportunity for participants to include other thoughts or feelings about places, thereby preventing further insights about those places.
- Place-based research can include the use of technology by providing participants with a web application that offers an interactive online map, requesting latitudinal and longitudinal coordinates of a place they prefer thus improving the accuracy and the quality of data collected by respondents.
- Place-based research can include the use of technology by providing participants with a website that is searching for favourite places, offering an online survey form that randomizes place statements, and a text box for participants to write their reasons why they value their favourite place, thus extending targeted research outcomes and increasing the scale and scope of the study.

- Places chosen by the researcher narrows the scope and freedom of the participant to choose for themselves a place they would feel more attached to.
- Places could be categorised correctly according to their natural environment, such as coastal, woodland, forest or urban.

The bulleted points above highlights certain gaps found in place-based research. Of interest, are the second and third points that highlights the use of technology, such as a web application, an online survey form, and an interactive online map which can help place-based researchers locate favourite places. Geoinformatics which is the study of technology and geographic information, is a discipline that provides a technological solution to help further meet geographic challenges in place-based research. And it is in the area of geoinformatics the study focuses on, applying web technology to finding favourite places geographically.

The following sections focuses on creating a web application called the “My Favourite Place” (MFP), which was used to find favourite places through volunteered geographic information (VGI) crowdsourcing activities. That being the case, the study focuses on two approaches: Geoinformatics and User Interface Design.

1.7 The Need to Find Favourite Places

The need to find favourite places helps toward understanding why people visit a favourite place and how a preferred place affects their emotions. According to Korpela (1992), favourite places affects one’s self-esteem and improves peoples experiences. In, “*Adolescents Favourite Places and Environmental Self-Regulation*”, students aged 17 and 18 were invited to write essays about their favourite places and to share their experiences and feelings about those places concerning the self. Korpela described their essays as self-reported interpretations (1992), to which the students shared their personal experiences of their favourite places. Their expressions reflected positive memories and feelings of preference for a place, even if they

could not explain why they felt that way about their favourite place. It was just a favourite place to them. These unexplained feelings reveal that adolescents may not fully understand why they like a favourite place other than how that place makes them feel (Korpela, 1992).

In general, existing studies assert that a physical environment might be used as a strategy to affect, or regulate (Korpela, 1992) one's emotions, even maintaining self (Swann, 1983, as cited in Korpela, 1992). According to researchers, there are psychological benefits to people who are recipients of external factors. For example, external factors affects the visceral processes and the sensors of feelings of pleasure and pain. Favourite places incite enjoyment, pleasure, and soothes painful feelings. Engler spoke of “view places” (1990), or physical environments that were used by people for self-reflection. Favourite places can also provide a peaceful and calm atmosphere for children and adolescents (Korpela, 1992).

1.8 Research Questions

The need for finding favourite places is important for local government, residents, policymakers, urban planning, and management organizations. This is because natural and physical landscapes provides a people-to-places or places-to-people relationship. Since finding favourite places is important to research and government agencies, the study area in favourite places, from a geoinformatics approach, can now be conceptualized further.

Firstly, finding people's favourite places would require an instrument such as a shared interactive map that is accessible to users' for greater user reach. Secondly, the map design must include retrievals of latitudinal and longitudinal coordinates from users when clicking on the map. Thirdly, the user interface of the website should be designed with attractive interface design aspects and hypertext markup language (HTML) features, such as a text box for participant comments embedded into the online survey form. Fourthly, the survey would provide a 7-point Likert scale to measure peoples' views from a comprehensive set of 16 place

statements. These four components works towards a common goal of finding favourite places, and helps formulate the following four research questions, which are:

1. What design aspects in user interface design would produce a user-friendly web application?
2. How are some aspects of sense of place correlated with other aspects, positively or negatively?
3. How are particular places in New Zealand valued for particular aspects?
4. Why are some aspects of sense of place more strongly attached to certain places than others?

The answers to these four research questions are fully explained in Sections 4.1.9 and 4.5. The thesis will firstly review existing research methods on crowdsourcing, user interface design, VGI, and sense of place. Secondly, an analysis of the results from Surveys One, Two and Three will be discussed in Section 4, to help answer the above four research questions.

1.9 Creating a Favourite Places Framework

The *favourite places* framework consists of a series of questions and steps focusing on favourite places as seen in Figure 1. Using keywords such as “favourite places”, the following questions are raised:

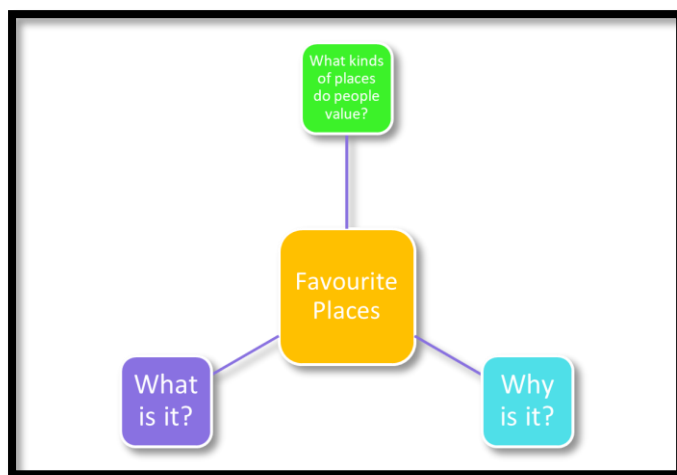
1. Where are favourite places?
2. What kinds of places do people consider “favourite”?

3. Why do they value these places?
4. Are there differences between favourite places and places?
5. Are there stronger attachment for certain places more than others?
6. How do places become favourite places?

The above questions created the favourite places framework. The topic theme of “favourite places” became an important aspect of this research’s objectives.

Figure 1

Commencing Study with Questions



1.10 A Method to Collect Data

After six questions were established for the favourite places framework, a method of finding favourite places and how to collect data became important. In Figure 2, the diagram shows a cycle of data collection steps highlighting the need of including a map instrument. The inner core theme is the website, however, the surrounding six circles outlines the search for favourite places by establishing the need to retrieve locational coordinates, answering the what and why questions of favourite places, choosing place statements, and measuring place values on a Likert scale. These are key features for the collection of favourite places.

Figure 2

Finding Favourite Places



Lastly, the website would need to be hosted on a server, so that the web files can be displayed and data can be collected from the public for storage and retrieval. Responses would then be analysed and comments transferred into the “My Favourite Place” corpus for further review.

1.11 Creating a Website Framework for the “My Favourite Place” Web Application

After establishing how the data would be collected, a website framework for the web application relevant to the preliminary study was required. The *website framework* begins with a series of questions such as:

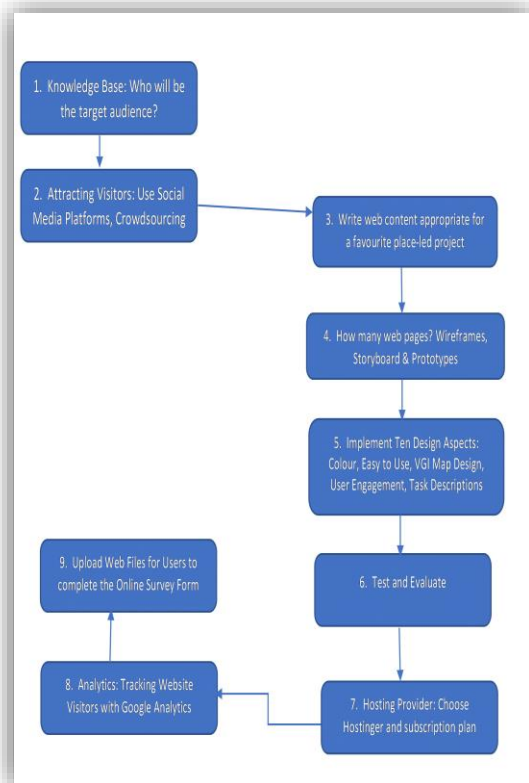
1. Who will be the target audience of the website?
2. How will users and visitors be directed to the website?
3. What kinds of content would be most appropriate for the website?
4. How many pages should the website have?
5. What user design aspects should be implemented into the website?
6. How could these design aspects be tested?
7. Who will host the website?

8. How will website visitors be tracked?
9. How will the data be collected?

In Figure 3, the process of creating the website framework for the “My Favourite Place” web application is explained through a series of questions.

Figure 3

Series of Questions for the Website Framework



The questions in Figure 3 show the importance of the web design and development process for the “My Favourite Place” web application, and that the user interface design features of the project would be analysed in the preliminary study.

1.12 Usability Goals

Setting usability goals for enhancing user experience requires four usability goals in the web application design. According to Preece, Sharp, and Rogers (2015), a product that is effective in meeting a project's aim should be aligned with usability goals. As part of the "My Favourite Place" website, four usability goals were set as listed below:

1. Effectiveness

The web application should be effective in achieving its purpose.

2. Efficiency

Users performing tasks can complete them.

3. Learnability

The product is easy to learn.

4. Accessibility

The product can be used by the disabled and those who are colour-blind.

These usability goals help the product function as it should with specific goals, making the user experience more enjoyable while collecting quality data from respondents.

1.13 Four Components of the Favourite Places Framework

The favourite places framework for finding favourite places are further defined and is similar to the framework created by Lai et al. (2019). The four key components required for a favourite place-led project are:

- (1) A map.

- (2) Latitudinal and longitudinal coordinates.

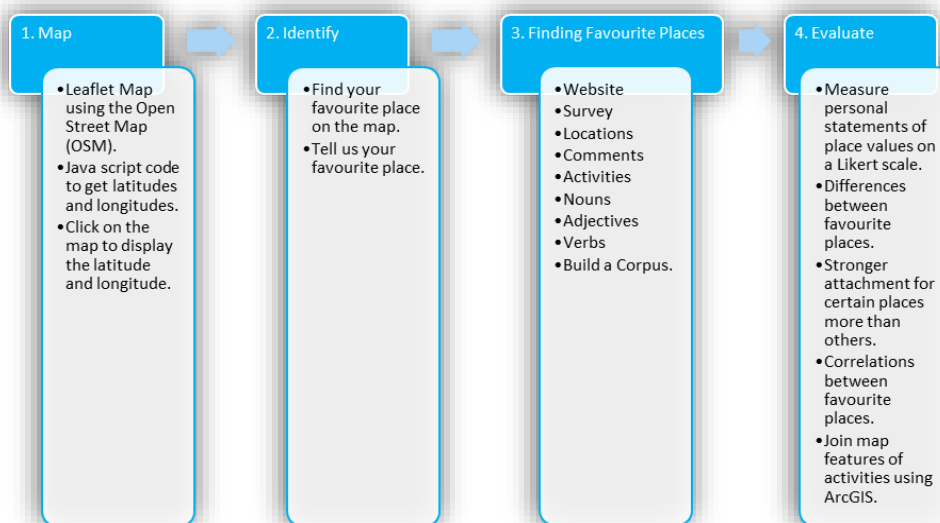
- (3) Finding favourite places.

- (4) Evaluating place-based values, descriptions and activities to find preferences and correlations by people between place values.

In Figure 4, the four components are broken down into smaller tasks requiring coding, map design, creating a corpus, and many other tasks that will be later discussed in the following sections.

Figure 4

A Favourite Places-Led Approach



The four components of the favourite places framework, now established, refines the purpose of the study, its aims, objectives, usability goals to help answer four key research questions.

1.14 Purpose of The Study

The purpose of the study is to provide a geospatial interpretation of favourite places in New Zealand by analysing the locations, descriptions, and activities people engage in while at their favourite place. The search for favourite places is narrow in scope and specific. As such, the research topic focuses only on favourite places in New Zealand and Wales. The relevance of favourite places in the study of geoinformatics is demonstrated by providing a technological solution to finding geographical favourite places, which in turn, contributes towards the

research of the platial sciences. One way of demonstrating how technology can find favourite places would be by building a web technology that is accessible by people, enabling easier internet reach. The technology would provide an interactive map for users who can submit accurate locations of their favourite places.

The relevance of applying user interface design to the proposed web technology was to consider how design principles might affect the quality and quantity of responses contributed to crowdsourcing projects such as this research project called, “My Favourite Place”. The wider relevance of finding favourite places, however, has a much greater importance to those who will benefit mostly from the study, such as policymakers, local government, councils, organizations, research institutions and businesses. These key stakeholders play critical roles in supporting a cleaner, safer and prosperous environment for urban and rural communities.

Finally, this study is both empirical and theoretical and applies several disciplines to the thesis, such as sense of place, environmental psychology, geoinformatics, user interface design, crowdsourcing, tourism and volunteered geographic information (VGI), which works towards understanding peoples reasons for preferring favourite places more than others.

1.15 Objectives

The objectives of the study are primarily focused on finding favourite places, sourcing data from the public through a web application. The study will be using crowdsourcing methods by approaching the public online and asking them to perform one crowdsourcing task.

There are two objectives for the study. They are listed below:

1. User Interface Design Objectives

To build twelve experimental web interfaces for users to test and evaluate various versions of the “My Favourite Place” web application, and assess which design aspects would be important in the final build.

2. Sense of Place Objectives

To find favourite places through use of a map and an online survey using the newly built web application, and to find reasons why people value their favourite place through use of a 7-point Likert measurement scale.

Narrowing the objectives to just two research aims will refine the search for favourite places.

1.16 Thesis Structure

The thesis structure is divided into six sections. Section One is the “*Introduction*” and discusses the background, purpose, and objectives of this research and how it relates to other research topics. Section Two is the “*Literature Review*” which discusses favourite places, sense of place, VGI, map activities, VGI applications, gamification, and crowdsourcing. Section Three discusses the “*Research Methodology*” and the research methods used for three surveys and one pilot study. It explains the design of the web application, twelve experimental web interfaces, and ten user interface design aspects. Section Three also focuses on building the web application, connecting the website to the Massey University server, the webserver and the database, the pilot study, and the launching of the website on the world wide web. Section Four discusses the “*Results*” which analyses, summarizes and presents findings on user-friendly design principles for the website in Survey One. It also presents findings for the main study, Survey Two, in New Zealand. Further, Section Four discusses the study in Wales, and makes comparisons between New Zealand and Wales in Survey Three, finding differences or similarities between place values and descriptions. Section Five is the “*Discussion*”. Section Six is the “*Conclusion*” of the study, and considers existing and future research topics that can derive from this study.

2 Literature Review

The literature review comprises of three separate parts. In Sections 2.2 to 2.4 the concept of favourite places, sense of place, and methods used in platial research will be discussed. This first part discusses why people value certain places more than other locations, and how place attachment affects people's views of place and their connection to place. Section 2.5 will review user interface design principles, particularly specific design factors for building a user-friendly VGI crowdsourcing web application. Sections 2.6 and 2.7 will discuss crowdsourcing in a VGI context. And finally, Section 2.8 will conclude with a summary of the literature review.

2.1 Overview

Finding favourite places in New Zealand and Wales requires an understanding of what is a favourite place for people of various ages. An adult's perspective of a favourite place differs greatly to a child, as also an adolescent's perspective of favourite places to an adult, or an adult compared to that of an elderly person. This suggests that favourite places differ across age categories, implying that what would be a favourite to a child (or an adolescent) might not necessarily be a favourite to an adult.

Since the perspectives of favourite places differs across all ages, it would be better defining favourite places to an age group, thus allowing people the option of choosing places that would typically be a favourite for adults within a specified age group; so that what is considered a favourite place to adults, is a favourite place to others. Therefore, the study was delimited to a targeted age group from the ages of 18 years and older, so that favourite places would be analyzed within the category of adults. The decision of delimiting the study to adults provided a more useful set of data, resulting in a good distribution of responses. That being

the case, this discussion begins by posing an important question: Just exactly, what is a favourite place?

Simply put, favourite places are defined as places that are more agreeable than others (Korpela, 1992), or liked more than others because of their aesthetic attributes (Wilkie & Stavridou, 2013), their intrinsic properties, and the physical features of that place (Korpela, 1992). Favourite places are places where people engage in enjoyable activities (Lecompte et al., 2017), a place that provides people with emotional stability and happiness. Favourite places are places people visit (Johnsen, 2013) and are places for self-review of their experiences as Relph suggests (Relph, 1976, as cited in Blaison & Hess, 2016).

2.2 Favourite Places

Favourite places provides a physical, emotional, and mental benefit to people. They can improve people's well-being, happiness, and enjoyment in life (Korpela, Korhonen, Nummi, Martos, & Sallay, 2020). Favourite places helps one's mood (Johnsen, 2013), alleviating their emotional stresses (Korpela & Ylén, 2009). Johnsen (2013) asserted that favourite places in natural settings affects people's positive and negative emotions. People who avoid visiting favourite places, however, do not experience restorative benefits like those who visit their favourite places (Korpela & Ylén, 2009).

Favourite places are also common places in natural settings (Korpela et al., 2020), such as in the wilderness or natural areas (Johnsen, 2013). These types of natural settings can be found across New Zealand and Wales, and yet, there is little research information available showing the connection between emotional improvements and favourite places. Studies suggests there are links between people's emotions and the environment (Kaplan, 1995). According to Johnsen (2013), people have their emotions analysed using measurements of scale, as assertions merely understood and stated, though not confirmed through rigorous testing, or by other precise methods.

In a study of favourite places and preferred places in Norway, there were 142 participants who had received questionnaires at two wilderness and natural areas in Norway. The purpose of the questionnaire was to monitor participants' emotions, personalities, and stress levels while at two different natural areas. The findings of their study showed that both positive and negative emotions were related to stress. The measurement used in Johnsen's (2013) study, was a scale that measured their emotions and landscapes, exploring how their responses might have affected their personalities and whether there were any personal restorative benefits. Participants had their emotions measured on a Likert scale changing from positive to negative emotions whenever their stress levels had changed. They used questionnaires to self-report those changes as a method of identifying how the wilderness affected their emotional health.

Instruments such as a Likert scale or questionnaires are current methods used in place-based research, as also the format of paper-based self-reporting. The use of a scale in Johnsen's (2013) study was an effective method to measure emotions and views on sense of place. Authors Brown and Weber (2007) also chose a 5-point Likert scale to effectively measure people's views on place values. Therefore, a Likert scale is an effective measurement tool as it allows the use of point numbers, or integers, to explain the degree of agreement or disagreement on a research topic.

Applying such a measurement scale to this study would also prove useful in understanding people's preference for different landscape values, even extending the measurement to a 7-point Likert scale for greater interpolation and a good set of responses. While the paper-based questionnaires used in Johnsen's (2013) study was an effective traditional method of collecting data, as was also the paper-based diaries of recording favourite places in Korpela and Ylén's (2009) study, it would be more appropriate for this study to create a single online survey allowing for a wider reach of people. A single online survey

accommodates convenience and accessibility much like the method used by Gray, Milton, and Hudson-Smith (2015) who created a web application called the “Survey Mapper”, directing people to complete an online survey which included the use of a map.

2.2.1 Negative Views of Favourite Places

Favourite places undergo landscape changes and can ignite negative responses to those places. For example, in a study about public spaces in Germany, the authors focused on the emotional reaction of people whose favourite places were affected by landscape changes. People’s responses were either (1) resilient or (2) non-resilient (Riechers, Henkel, Engbers, & Fischer, 2019). Addressing the emotional needs of the respondents, the authors set up a social art workshop as a method of identifying their feelings of place attachment. The researchers then used an artist to conduct art workshops, encouraging them to express their emotions with social art and text descriptions. One man wrote about his anger over his favourite tree being cut down, a tree he had loved (Riechers et al., 2019). Another person spoke about a nitrate problem that lasted around “20 or 25 years” (Riechers et al., 2019). This type of qualitative approach revealed responses by people who showed feelings of anger, despair, and blame in a controlled environment.

The study conducted by Riechers et al. (2019) demonstrated that people developed an attachment for places, which at times, included a favourite landscape feature or object, such as a favourite tree. Also, favourite places or physical landscape features can include an element of time, such as the respondent who spoke of a nitrate problem lasting some 25 years. These insights show that while favourite places are in general positive places, they can also be viewed negatively when they undergo landscape changes. Such changes affects people’s emotions to that of anger and blame, creating negative views about their favourite place.

2.2.2 Favourite Places, Secrecy and Tourism

Locals are sometimes hesitant sharing their secret favourite places with tourists because locals will feel differently about their favourite places once told to others. For example, local hunters were becoming uncomfortable with tourists acquiring knowledge of their favourite hunting or fishing places in the Lake District in the northern region of Norway. The hunters and anglers would rather have kept these favourite places private, especially from tourists, since the locals were surprised to see at least 30 people fishing at Lake Arac, a place which was at one time a “well-hidden secret” (Svensson, 2016).

In “*Do You Have Any Particular Favourite Place? Hunters’ and Anglers’ Secrets Meet Tourism in Northern Norway*”, a discussion between Han and a man named Pers was recorded. Pers wanted to know specific favourite fishing places at Lake Arac. Hans was hesitant sharing such secrets and referred to “over there” though not providing exact details of where “over there” might be (Svensson, 2016). Han’s response, though vague, suggests that Han might not have really kept his fishing place secret, because he perhaps pointed to, or gestured, towards a direction of where his favourite fishing place was. This indicates that Han was reluctant in telling the tourist the exact location, and yet, provided some direction of his favourite fishing places.

Ambiguity of sharing secret places with tourists, raises questions of whether favourite hunting or fishing places by locals should be shared with others? And would sharing these places with tourists make local people feel better or worse about their favourite places? Svensson (2016) asserts that in a cultural context, sharing favourite places of good hunting and angling areas raises suspicion and affects place value. In some cases, local hunters and anglers opt for secrecy by keeping the place secret thus maintaining a value of that place (to themselves), rather than sharing the value of that place with others. The study, however, did not explore how or why would sharing secret favourite places to tourists change the locals’

view of their favourite place. These questions would make a good area of investigation on whether place value changes when secret favourite places are shared with tourists.

2.2.3 Favourite Places and Adults

Favourite places chosen by adults included places of exercise, meeting places, and the backyard (Korpela & Ylén, 2009). In a study conducted by Korpela and Ylén (2009), participants were given a diary so that they could write down their favourite places they had visited within five days. The study assigned the participants into three groups; a favourite-place group, a not-visiting group, and a control group of people (Korpela & Ylén, 2009). Participants were asked to visit their favourite place at least once a day for five days. The favourite-place group had to visit their favourite place at least three times during the five days, the not-visiting group had to visit at least once during the five days, and the controlled group had no criteria. The participants had to self-report in their diaries whether a place they visited would be considered a favourite place or not, and to write a “Yes” or “No” answer.

The findings showed that people who visited their favourite places more than the ones who did not visit their favourite places experienced more positive restorative experiences than the other two groups, indicating that favourite places helped them rejuvenate physically, mentally and emotionally (Korpela & Ylén, 2009). Of interest, was that the favourite places in Korpela and Ylén’s (2009) study were places they frequented and included places that would otherwise be considered as part of one’s schedule, such as meeting places or exercise places. They were also asked to visit their favourite place once for five days, or three times during a five day period, which in some ways defined how often they should visit their favourite places. It also raises questions as to whether the visits were more from a health-benefit perspective rather than a study about favourite places. Finally, the self-reporting method of writing in a diary daily and choosing for themselves to report which place the respondent considered to be important, did not include why the place was a favourite place to them, since all they needed

to report was whether the place was a favourite place or not, with a simple “Yes” or “No” (Korpela & Ylén, 2009).

2.2.4 Favourite Places and Adolescents

People’s preferences for favourite places vary and it seems that the type of places people like can differ according to age. For example, in one study focusing on favourite places and adolescents in Tampere, Finland, 144 participants aged between 17 to 18 years old had to write essays about their favourite place (Korpela, 1992), specifically answering the questions of: What is your favourite place? Where is your favourite place? Was there anything you had done there that was important to you?

In response, 54% reported their favourite places were places outside the home, such as 15% at restaurants, 15% at natural landscapes, 4% on the streets, 13% at sports facilities, 7% at clubs, and 7% at other places (Korpela, 1992). Interestingly, however, 39% (Korpela, 1992) of the respondents wrote in their essays that home was their favourite place, referring to features that made it their favourite place such as the couch, bed, sauna, or a particular room in the house, such as the bathroom, or the bedroom. Some respondents felt that their previous home was their favourite place because it was linked to a family relative, such as a grandparent (Korpela, 1992). This raises a good point about favourite places and adolescents: Adolescents in Korpela’s study chose rooms or features in their houses as favourite places to them, possibly because it included the need for privacy, self-isolation, watching entertainment on multi-media devices, or playing games in their rooms (Korpela, 1992). Finally, favourite places such as rooms or features in the house might not necessarily be favourite places for adults.

2.2.5 Favourite Places and Children

Favourite or special places in young children are places they enjoy playing, whether in an open space, or at a place where there are features within that space that allows them to do things. In another study involving children from Denmark aged 5 to 12 years of age (Rasmussen, 2004),

Rasmussen conducted a study involving children's view of meaningful places and whether they would connect to places once they took photographs of these places. For example, Lena a 7-year-old girl took a photograph of a courtyard outside her home where she played and referred to the courtyard as "my courtyard", using the possessive noun. Lena mentioned objects or features in the courtyard such as, "slide", "swings", and a "sandbox" (Rasmussen, 2004), describing what made her courtyard a favourite place. Another child, called Anders, an 8-year-old boy took a photo of what appeared to be a plot of land but to which he described that he and his friends liked "playing games" (Rasmussen, 2004) on that piece of land.

Though somewhat strange, Anders' views of that plot of land were linked to playing with his friends. Rasmussen's study highlights an important issue about how adults perceive a child's favourite place compared to how a child views his or her favourite place. Adults create places for children at home, or school (Rasmussen, 2004). However, the spatial orientation of a child differs from adults because children connect to places, they find meaningful (Rasmussen, 2004). These examples show that children, like adults, viewed their favourite places as enjoyable spaces, places for them to do things, and where memories were born.

In another study on favourite places, Brown (2017) conducted interviews at a secondary school in the Southeast of England involving five children, to investigate whether a child's neighbourhood affects their spatial views on themselves, whether school improves their identity, and whether school would be a positive space affecting achievement. When asked the question, "What's your favourite place in school?" (Brown, 2017), some of the students chose as their favourite place a tutor room, a French class, the art room, the hall, and a small courtyard. These responses show, however, that the children viewed these places as areas to avoid "monitoring" and surveillance" from teachers (Brown, 2017). They were also places that allowed hiding or escaping from people while at school. Also, one would have to question

whether the adolescent's favourite places in this study was really "favourite" because they were places of avoidance, opportunity, or withdrawal, and were not completely places of positive thought or reflection.

2.2.6 Comparing Favourite Places of Adults with Favourite Places of Children

Favourite places for adults are places they need or want for private thought, isolation, enjoyment, satisfaction, relaxation, or reflection in life, human existence, and enjoyment. Studies show that humans experience pain (Manzo, 2003), suffering (Duff, 2012), and happiness (Johnsen, 2013), and will use places to help them emotionally, physically, mentally, and psychologically. The physical attributes of places also help people enjoy the air, water, landscape, wildlife, and other living organisms they might find enjoyment from. These places allowed them to engage in activities for personal achievement, happiness, or self-development.

Favourite places for adolescents are places for socialising or withdrawal. In either case, the adolescent actively does things. However, much of the adolescents in Korpela's (1992) study reported on places they were familiar with, and places that young people frequent. In that study, the adolescents reported on the physical objects in their environment, their activities, and their experiences they considered important to them during adolescence (Korpela, 1992). For example, the adolescents viewed home as a favourite place, suggesting that they were probably at the house for most hours of the time, other than being at school. It also suggests that favourite places for adolescents may not be as varied as an adult, who experiences more in life through travel, adventure, and outdoor activities, and for which, engages in activities that benefit themselves or the people they are with while at their favourite place.

Favourite places for children are generally playing areas. As demonstrated in three separate studies involving favourite places for children and adolescents in Finland, England and Denmark, the results showed that children liked favourite places to play either with themselves or with friends. Or, in the case of adolescents, favourite places were rooms,

classrooms, halls, and parts of the house to either isolate, withdraw, hide from adults, or to engage in hobbies and activities.

In each category, it is noteworthy that favourite places allow humans to find enjoyment, feel happy, isolate, withdraw or avoid, and are places that are used to reflect on one's thoughts to find personal development or achievement. People create memories from their experiences, even when it includes other people, such as the young boy Anders in Rasmussen's study (2004) who took a photo of a piece of land that had piled up dirt, telling Rasmussen that area of land was the area he played games with his friends. Since favourite places differs across age categories, the age requirements for this study would mean delimiting the age group to 18 years and older as being the preferred age category for the study.

2.2.7 Unknowns about Favourite Places

While there is some knowledge about favourite places, there are many unknowns in favourite-place research. In "*Environmental self-regulation in favourite places of Finnish and Hungarian adults*", the authors (2020) asserted that people's favourite places and their reasons for going to those places are still unknown. Also lacking, are their experiences while at their favourite places, and how those different types of experiences affected their overall happiness and wellbeing (Korpela et al., 2020). Information about favourite places and adults is scant, even in spite of existing works currently available (Korpela et al., 2020). These existing unknowns in favourite-place research creates opportunities for researchers to pursue new findings.

2.3 Sense of Place

Sense of place is the experiential constructs of place in which the experiences people have at a place becomes part of the way they interact with their surroundings and environment (Tuan, 1977). It is a sense of how they as a person discover themselves while interacting with the

environment (Manzo, 2003). According to Erdiaw-Kwasie and Basson (2018), people's sense of place motivates them to engage in action toward sustainability. For example, Erdiaw-Kwasie and Basson (2018) described place identity as the "cognitive connection" between place and person where social interactions occur as well as the creation and maintenance of self.

The sense of place concept begins with the place and one's view of the place. Studies show that place consists of many things, and Relph (1976) described the place as comprising of structural, physical, and whole properties that live and exist, or stand within a defined place or location. It is both individual and collective, person-entity or group-entities, in which activities take place and for which people create experiences and memories thereafter. In such an environment defined by place, it is a place that becomes a construct of experiences.

Yet, according to Relph (1976), place includes all things both living and non-living whether structural or existing from which activities takes place. Tuan (1977) spoke of place as something new, since once a person becomes familiar with a new place, he then becomes familiar with this new space so that it then becomes more than just space, but a place for him especially since experiences and memories are born through familiarity and frequency of being at the same place.

Galliano and Loeffler (1999) described a sense of place as the things within that space, or now-familiar place, as central to one's personal life's experiences, memories, and all other things associated with place. However, despite these understandings, little is said about people-to-people and the human relationships gained from each other who share the same space with others. These people would also be ones who felt loved, shared, and created such memories with others, and for which are part of people's own constructs.

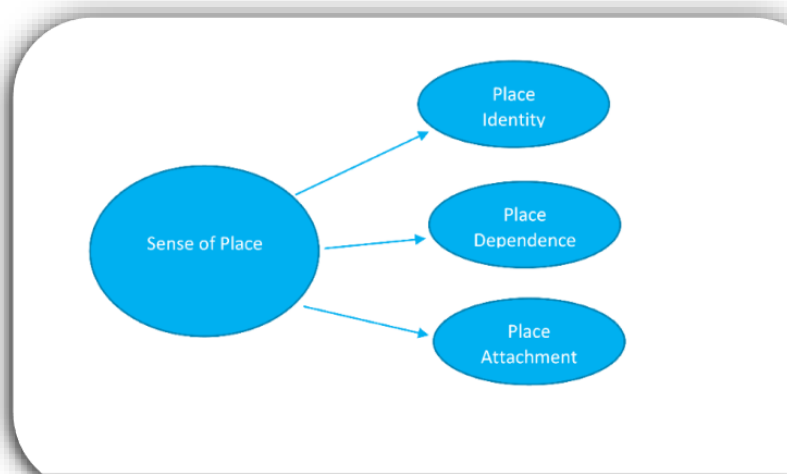
2.3.1 Sense of Place and Environmental Psychology

The sense of place concept (see Figure 5) is a relationship between places and people in which people will display, sense, or feel a certain behaviour towards a place whether arising from their cognitive, conative, or affective behaviours. Jorgensen and Stedman (2006) explained that certain place dimensions also affect peoples' behaviour towards place. As a result of merging these two lines of thought, the authors gave birth to a trichotomous, multi-dimensional understanding of the sense of place concept, combining place dimensions with people.

Azizul, Knight-Lenihan, and van Roon (2016) asserted that sense of place constructs can be understood as a “tripartite of three multi-dimensional constructs” with three sides, combining three place dimensions of place identity, place dependence, and place attachment. The sense of place description as being trichotomous and place-multi-dimensional is also a construct of place dimension, paired off with one of three human behaviours that is either cognitive, conative, and affective.

Figure 5

Sense of Place Concept



For example, (1) place identity is how one perceives themselves, or its the beliefs people have about a place involving their cognitive processes, (2) place dependence relies on the purposeful

conative approach of committing oneself or intending to do something towards the place, and finally (3) place attachment expresses the emotive aspects within people, affecting their psychological behaviour of how they see themselves in relation to the place (Jorgensen & Stedman, 2006).

Environmental psychology involves the mental processes of the human brain that perceives its existence with the physical properties of land, sea, and other forms of living organisms. Researchers in this field such as Low and Altman (1992) asserted that people and landscapes have a relationship. Some researchers commonly employ sense of place concepts to environmental psychology to understand and interpret people's perceptions of self, their emotions, and their associations with landscapes. However, other researchers have argued that place and environmental psychology are not the only elements of understanding place and human behaviour as Sime asserts (1995, as cited in Azizul et al., 2016). Since, according to Azizul et al. (2016), environmental psychology claims that human behaviour creates one's view of place, rather than the role of place (the geometric boundaries of space), as being the key constructs of people's life experiences and memories who frequent or live at those places. Jorgensen and Stedman (2002) argued that sense of place is a person's attitude towards spatial measurements, and that sense of place is also understood from an "attitude approach" based on how people interpret their space.

Regardless, of whether there is a disagreement between researchers of different disciplines as to what constitutes one's sense of place and which approach would be the most appropriate in place-based research, there is sufficient evidence to suggest that through empirical studies, sense of place concepts such as those of a tripartite three-dimensional concept is an acceptable concept that has been tested and established as a viable concept.

2.3.2 Sense of Place and Landscapes

A sense of place is strongly associated with a person's sense of belonging, or identity to a place (Sampson & Goodrich, 2000). The concept begins with one's view of landscapes. Landscape refers to the physical, geographic space, that interacts with people who uses its physical properties such as water, air, and soil, to gain physical and emotional benefits. Landscapes are geometrical shapes representing boundaries (Sampson & Goodrich, 2000), thereby defining places and locations.

2.3.3 The People-to-Places Relationship

The interactions between landscape and people are considered a people-to-places relationship. The people-to-places relationship is expressed through place identity (Manzo, 2003). For example, Manzo (2003) suggested that a person's identity is separate to place but then associated to place. Also, people's dependence on agriculture or dwellings which rests on soil, helps them to live. In this way, dependence on place increases as survival is heavily dependent on food and water, thereby strengthening the people-to-places relationship (Manzo, 2003).

2.3.4 The Places-to-People Relationship

On the other hand, places-to-people is a relationship between place attachment and place identity (Manzo, 2003). Place attachment is a bond between people and the place (Manzo, 2003), or places they feel they belong to or own (Low & Altman, 1992, as cited in Manzo, 2003). Place identity is how people feel about themselves and the environment. It creates an identity for an individual or a community (Manzo, 2003), such as the communities of Akaroa and Bannockburn, New Zealand in Stephenson's (2008) study.

The identity of self and landscapes can at times be an emotional relationship (Manzo, 2003). An emotional relationship to places is also a phenomenological study, which is the study of descriptive things, such as remembering a place including the settings and the experiences that occurred at that place (Manzo, 2003). These emotions appear when there has

been a physical landscape change, affecting people's reactions to the changed landscape. Key stakeholders must respond to such emotional reactions through bio-regional planning (Sampson & Goodrich, 2000), through assessment and evaluation of attitudes by people, then through stakeholders as evaluators and assessors on behalf of the people. The authors proposed a "conceptual framework" (Sampson & Goodrich, 2000) that helps people understand the sense of place concept and the role of actors or key stakeholders. These actors, such as policymakers, local council, and government agencies assist in planning socio-ecosystem policies, interests, and objectives as a response to peoples' need for places and spaces.

There is a social and ecological impact on people when landscapes change through urban planning. In, "*Sense shaping place: repositioning the role of sense of place in social ecological systems from a bioregional planning viewpoint*", the authors (Azizul et al., 2016) provided a theoretical discussion of sense of place from a bioregional planning approach. Authors asserted that planners must consider people's views of sense of place when a transformation of landscape occurs and that individuals needed to be sensible about the environment and their ecosystem surroundings as landscape changes and becomes the concern of the community. In achieving their goals, planners must consider the social, ecological context and the consequences of change.

2.3.5 Negative Views of Sense of Place

Woody landscapes improve the overall well-being of mentally-ill youth (Milligan & Bingley, 2006), as woody areas are therapeutic and can help a person spiritually, mentally, emotionally, and physically. They are also said to relieve stress and fatigue providing restorative benefits to people such as the woodlands in Norway in Johnsen's (2013) study. However, one might object here and assert that woody areas do not always provide a measure of safety. Would such an environment of open spaces in the woods be beneficial to mentally-ill youths who might otherwise veer off from dedicated walking tracks while losing their way through the forest?

Also, too, would all people agree that a woodland area is therapeutic and a place that one might feel attached to? Milligan and Bingley (2006) challenged whether restorative places are scary spaces. In, “*Restorative places or scary places?*”, the authors asserted that some viewed woody areas as “frightening” (2006), while others felt anxious, scared, trapped, and unsafe.

Some of these views were developed in early childhood, especially since they had to be with another adult while walking through a forest. It is also known that in some parts of a forest there are densely wooded areas that are shaded and darker than the more obvious lighter, open areas of the woodlands. Since these dark spaces have less natural light shining through the forest, one’s safety could be threatened as trampers pass through shaded areas. Gatersleben and Andrews (2012) also asserted that woody areas could potentially create negative reactions, such as being bitten by snakes, bees, or wildlife. Then there is the fear of being attacked by humans or wildlife, especially, since there are many unsuspecting hiding places in woody areas (Gatersleben & Andrews, 2012). Counterarguments such as those by Milligan and Bingley (2006), or Gatersleben and Andrews (2012) are insightful because it supports the argument that some landscapes are not therapeutic to everyone as some will view these types of woody forests as a risk to their safety, even scary.

Another example of places that are viewed negatively by people are places situated in bad locations. According to Blaison and Hess (2016), few people judge a place on its surrounding context. The authors tested six different neighbourhood scenarios that were negatively valenced to understand whether people’s sense of place changed when a neighbourhood did not feel safe. The six neighbourhood scenarios that would create negative reactions included moving to another town, a homicide, a rubbish landfill, and a housing area that was considered unsafe. The authors claimed that these types of negative scenarios affected one’s view of place (Blaison & Hess, 2016). The results showed that bad locations decreased people’s experiences of pleasant feelings, but (pleasant feelings) increased when further away

from bad locations. The study also asserted that people's sense of place was better when living in a good neighbourhood, compared to people's views made worse when they moved into a bad neighbourhood. More importantly, these examples show that a negative sense of place exists when people are afraid of certain landscapes, when they feel trapped or when they move into a bad neighbourhood.

2.3.6 Place Attachment and Scenic Places

Scenic places affects people's attachment to place. According to Kim (2012), viewers became attached to places they saw in film and became connected to those places. For example, places like Hobbiton in Matamata and Wellington, New Zealand, had attracted many fans of the movie trilogy, "Lord of the Rings" (LOTR) who after watching the movie, flew to New Zealand to visit Hobbiton. These fans then toured specific LOTR places, even re-enacting some movie scenes to live or re-live the experiences of characters in selected places from the LOTR trilogy. The question raised here however is, can people be attached to places they saw in an image or in a movie?

One objection would be the view that people create constructs of experiences from visiting a place (Galliano & Loeffler, 1999), and that scenic places affects people when they visit that place in person. This view was held by Galliano and Loeffler (1999), who asserted that some media images might create a place construct, but people's views of that place can change once they visit that place. The authors raised several good points such as, (1) a person that creates a construct of a place from an image is also unimpressed with the real appearance once he visits that place, (2) he may not experience the heightened feelings he initially felt once he saw the real place, (3) and he eventually changed his views of the place when he got to see the place in person (Galliano & Loeffler, 1999).

In another study conducted by Wilkie and Stavridou (2013), the authors compared two types of environments, urban and natural, using congruence to analyse peoples preference for

either environment through the use of photos and slides. The congruence refers to the potential restorative states and the types of environment people would prefer, which would explain the congruence of either environment. Of note, the respondents who participated in the study chose their preferred locations from a collection of photo slides. They were not there in person and therefore their responses only offered an aesthetic judgement on those images. These examples show that people can feel attached, or feel a preference for places seen in film, television, photos, or slides, though they had never visited those places (Kim, 2012). However, as Galliano and Loeffler suggests (1999), the constructs of experiences of a place formulate when they visit a place in person.

2.3.7 Sense of Place and Tourism

Sense of place and tourism are closely connected to place identity, place dependence and place attachment. In a study by Raana Shaykh-Baygloo (2021), the author applied features of place identity, place dependence, and place attachment to a study of 396 respondents in the Iranian city Shiraz. The measurement model consisted of 7 place attachment items, 3 place identity items, 7 place dependence items, 3 perceived quality and value of attraction items, and 3 satisfaction items (Raana Shaykh-Baygloo, 2021). Their findings showed that people felt a sense of place attachment to places they perceived as having quality, and their value for attractions was significant. The tourists were satisfied with attractions but felt less place dependent on places that offered these attractions.

Tourism attracts people to a place, and some who are visiting a new place for the first time will connect emotionally to that place. Smith (2015) describes different types of tourism associated with sense of place such as “heritage tourism” (Smith, 2015) which refers to a place of one’s heritage. Other types of tourism are “cultural tourism” (Smith, 2015) describing one’s ethnicity or the identity between the tourist and the locals. Then there is “geo-tourism” (Smith,

2015) which highlights the geology of the area or the geographical character of a place. Smith also spoke about “ethnic tourism” and “indigenous tourism” (Smith, 2015).

Tourists are attracted to places they like and will return to visit their favourite places. In the journal, “*Tourism resort users’ participation in planning: Testing the public participation geographic information system method in Levi, Finnish Lapland*” by Kantola, Uusitaloa, Nivala, and Tuulentiea (2018), the authors found that in particular, nature areas provided landscapes that created a sense of place attachment for tourist visitors. In this study, the town Levi was chosen as the studied area due to its hilly landscape and a river which flows besides the resort village (Kantola et al., 2018). The results of the study was a success because favourite places were found in the Levi tourism resort areas that offered scenic landscape views, hiking activities, wilderness tracks, and goods and services that was along those tracks. The study also highlighted that scenery and landscape were usually places preferred by people, rather than places that offered a sense of identity.

However, some may ask how are place attachment and place identity perceived by tourists who are visiting a place only briefly, and in some cases for the first time? Some have argued that place identity is associated with time, and tourists needed more time in a place to really find their sense of place identity. Since they are often traveling through places, their perceived sense of place identity is based on travel that was not sufficiently long enough to link identities of themselves to the places they had visited (Kyle, Graefe, & Manning, 2003, as cited in Shaykh-Baygloo, 2021).

There is little information about tourism and its links to place (Smith, 2015). Also, the place is seen differently between locals and tourists. Tourists would view a place as meaningful (tourist attraction), especially if they liked its history, culture, or architecture more than the locals (Smith, 2015). But did the place offer an emotional, physical, or mental benefit to tourists, and how? Kantola et al.’s (2018) study does not mention how these benefits affected

the tourists. However, in earlier studies by Korpela and Ylén (2009), the authors asserted that favourite places generally offered a restorative benefit to the person.

2.3.8 Sense of Place and Cultural Values

Sense of place studies are also understood culturally since people's view of place differs ethnically between people of different races. For example, in a study of sense of place in New Zealand conducted by Hall, Michael, and Keelan (1993), the authors held the view that Pakeha (European) has a strong sense of place while Māori perceives landscapes from a white perspective. This is because Europeans translates landscapes differently compared to Māori. To the Europeans, elements of the landscape, or built environment constituted heritage, whereas, to the Māori, the relationship of people to the land was due to their roles as the “Tangata Whenua” (Hall et al., 1993) which means people of the land. The authors also asserted that Māori perceives humankind as “part of an indivisible whole”, and that their relationship to the land as custodians was an important interaction with space and place (Hall et al., 1993).

In another study conducted by Stephenson (2008), Stephenson chose as the research area two landscapes located in the South Island of New Zealand at Bannockburn and Akaroa in an effort to identify people's place values in a cultural context. This is because both areas have a rich cultural history between people and landscape. For example, at Akaroa, important Māori practices in the landscape would have included naming traditions, burial traditions, lookouts, signaling, whaling, fishing, walking, and trading routes (Stephenson, 2008). Stephenson's study was particularly useful in choosing this study's approach in the “My Favourite Place” project. Two of Stephenson's cultural values of genealogy and stories or myths was appropriate for a New Zealand audience and were used in Surveys Two and Three. These two statements did very well in the Welsh study and showed more agreement there than

the New Zealand data set. The Welsh results indicates that different countries of different cultural values perceived the two statements by Stephenson (2008) as important to them.

2.3.9 Place Statements

Place-based statements are statements made about places and in particular how people view a place according to its place value (Erdiaw-Kwasie & Basson, 2018). Participants engaging in a platial research project, such as this study, are asked to assign a number on a Likert scale to indicate the degree of agreement or disagreement of the place statement. In Brown and Raymond's (2007) study, the authors conducted five separate surveys in Alaska, and two surveys in Australia to understand place-based attachment. Participants used sticker dots to identify and map six places considered "special" to them (Brown & Raymond, 2007). There were also twelve dots on the map that identified different values, such as a recreational or a scenic value for different places. The dots had importance ratings ranging between 5 points to 50 points. The participants described twelve landscape values using sticker dots. They could use as many dots as they had wanted to use. Each value had a short statement attached to the dot. For example, the aesthetic, scenic value statement was, "I value these places for the attractive scenery, sights, smells or sounds." The place identity statement was, "I feel the Ottawa are a part of me." And the place dependence statement was, "I get more satisfaction out of living in the Otways than any other place." Statements used in Johnsen's (2013) study was, "I go out into nature to experience positive feelings", or "I often go out into nature when I am angry".

These examples showed the advantages of using place statements as they revealed how people felt about different place values whether positively or negatively, and how respondents felt about places and their preferences for place values when measured on a Likert scale. In this study, a fully comprehensive set of 16 place statements were used for Surveys Two and Three. Respondents rated the degree of agreement or disagreement for the 16 statements on a

7-point Likert scale. An average Likert mean score was then sought from 114 respondents to determine how agreeable or disagreeable a place value was to them.

2.4 Sense of Place Methods

Sense of place methods involve a variety of data collection methods such as collecting people's sense of place through photos, social media platforms, ethnographic methods or through interviews. This section discusses some methods used by researchers in place-based research.

2.4.1 Collecting Data from Instagram

In, “*Revealing cultural ecosystem services through Instagram images: The potential of social media volunteered geographic information for urban green infrastructure planning and governance*”, the authors used the social media platform, Instagram, to collect data using the geo-referenced hashtag “*#sharingcph*” in Copenhagen during 2014 (Guerrero et al., 2016). The authors extracted a total of over 50,000 images from Instagram. Their objectives were to study the health benefits, aesthetic enjoyment, and recreational opportunities that urban spaces provided for people in the city of Copenhagen.

The methods used included extracting images from Instagram and creating an interpretation of these images. The authors analysed different urban areas including urban nature areas. Their goal was to identify any patterns of shared images, people's sense of place in the urban city, any spatial data about the green or blue spaces, and how the results of their findings might help inform urban management and key stakeholders. After the authors classified 487 images (Guerrero et al., 2016), they built a website, uploaded the Instagram images and requested users to view the images, then classify them according to the categories defined within the accompanying information sheets they had received by the researchers. However, while the study generated a lot of respondents, including images, their methods for photo classifications of nature was largely performed by non-experts.

2.4.2 Collecting Data from Twitter and Wikipedia

In, “*Crowdsourcing a collective sense of place*”, the authors (Jenkins et al., 2016) extracted content from Twitter and Wikipedia entries of people’s comments relating to human activities and locations to find peoples sense of place. The authors used a thematic approach, searching for content that might characterize social behaviour in the context of places and locations. They also conducted topic modelling, semantic analysis, and cluster spatial analysis of locations to understand how people assigned places based on their views of specific locations and found that there was a link between social behaviour and locations. (Jenkins et al., 2016). The methods used enabled the authors to visualize the words through the use of thematic topics such as “Recreation”, or “Entertainment” to label locations (Jenkins et al., 2016). The locations were also analysed through topic modelling processes and the use of maps showed large samples of data points. Thematic topics are useful and topic modelling methods create interesting analysis on users’ comments, however in Jenkins et al.’s (2016) study, there was little explanation as to how they classified locations whether according to definition or by the name of the building (Jenkins et al., 2016).

2.4.3 Conducting Interviews

Sampson and Goodrich (2009) conducted interviews with 30 people ranging between one to two hours and provided qualitative data of how respondents felt about lineage, birthright, common behaviours and practices of people with a similar lineage. As part of their study, the authors asserted that there was a relationship between landscapes and lineage. The chosen study area (2009) was located in Westland, New Zealand in which the authors examined the relationship between landscape attributes and the landscape of the West Coast, New Zealand.

Authors Lecompte et al. (2017) conducted 31 personal individual interviews and meetings with users. In, “*Putting sense of place at the centre of place brand development*”, the authors asserted that people developed a sense of place when they frequented that place often.

Their study design began with a preliminary stage of holding 31 interviews specifically targeting second homeowner, resident, day visitor, gender, and age. The interview lasted 30 minutes asking respondents the purpose of using a place, their reasons for using that place, the descriptions about that place and the lived experiences of that place. Their findings showed that beauty is linked to physical elements. Respondents also emphasized they liked the wild aspects of a place, its open spaces, and the activities people can engage in while visiting that place.

2.4.4 Ethnographic Methods

Ethnographic approaches are another method to understand people's sense of place. Authors Lechner, Owen, Ang, and Kemp (2019) proposed a framework that combined quantitative and qualitative analysis for social and biophysical domains within a multi-user context. Data-gathering methods such as observing individuals and their behaviour, while conducting surveys and interviews were also included in place-based research. The authors' ethnographic methods included recording photographs, text, audio, video and participant accounts of daily routines. The results were then coded into a Geographic Information System (GIS) tool to conduct a spatial analysis of the collected data, identifying linkages between people and places.

2.5 User Interface Design

User interface design principles provides users with an interface they can interact with that is both attractive and pleasant. In crowdsourcing projects, the user interface is a tool to collect data and its final design should align itself with the organizations' objectives. In this section, a review of the user interface and design aspects is explained. User interface design aspects were pivotal to the success of the "My Favourite Place" web application, and several user interface design aspects were implemented into twelve experimental websites for users to test on in Survey One. Also, the user design process required good map design for the collection

of VGI data, and it was necessary to include one task description in the web interface for crowdsourcing activities. In the following subheadings, the literature review discusses four user interface design elements that helped build the web application used in this study, though in total, we had implemented ten design aspects into the final build.

2.5.1 Overview of the User Interface

A user interface is information displayed on an electronic computer monitor (Yushiana & Rani, 2007). Computer code called Hypertext Mark-up Language (HTML) is usually styled in Cascading Styling Sheets (CSS), and both languages display a website on a web browser. The user interface then interacts with users (Yushiana & Rani, 2007) and an impression is made. The user interface travels via the Hypertext Transfer Protocol (HTTP) and is uploaded on a web server. The user interface is displayed on the computer screen, and the appearance of the website is seen by the user.

There is a growing demand for web developers to design, create, and build user interfaces that are attractive, colourful, engaging, and interactive. At a visceral level, an aesthetically beautiful interface can stimulate and trigger an emotional response by users to buy their online products (Cheng, Wu, & Leiner, 2019). According to Preece et al. (2015), building a web application that implements good user interface design principles such as layout, simple in design, easy to use, and educational is generally recommended (Preece et al., 2015). Tractinsky (2000) asserted that users perceive attractive interfaces as desirable and easy to use. The author also compared attractive websites to social environments in which people perceived beautiful people as important and preferred (2000). Jakob Nielsen (2005) spoke about ten principles of good user interface design, asserting that these ten principles are heuristic guidelines for measuring good websites.

User interface design principles provides users with an interface they can interact with that is both attractive and pleasant. Images, headings, video, and colour, which according to

Garett (2011), helps attract users to the website and is an effective way to promote the website's messages. While these points are important, the challenge for many web designers involves the user interface design process of deciding on the amount of design features chosen for the web design. Also too, users' needs in web design differs across ages, such as those who are affected by impaired vision, or colour blindness, and need to see the colours in websites correctly. Since user interfaces are designed for users, it is important to select design principles that benefit users. In the "My Favourite Place" website application, ten design variables, or aspects, were chosen and tested on real users in Survey One to ensure the design of the web application was user-friendly.

2.5.2 Colour

According to Cheng et al. (2019), colour is rarely used to create an emotional bond between the products and audiences, and yet colour produces stimuli affecting consumer behaviour. For example, the colour red is tense (Bellizzi & Hite, 1992), or strong (Swasty & Adriyanto, 2017). Coloured photos are said to enhance the appearance of photos more than black and white photos (Meyers-Levy & Peracchio, 1995). Cheng et al. (2019) asserted that colour affects the senses, the cognitive state and can change that way users perceive things. Preece et al. (2015) asserted that colour that is likeable and pleasing to viewers are more tolerated by users (Preece et al., 2015). Swasty and Adriyanto (2017) asserted that if colours harmonize, users will find the website engaging.

In, "*Does Color Matter on web user interface design?*", the authors asserted colour makes a difference in web user interface design. The authors presented their findings from observing four websites in which they "exploited the use of color" (Swasty & Adriyanto, 2017) in the user interface design process. While the survey in their study was specific to colour and purchasing behaviour, the survey focused on four websites, requesting participants to measure the first website based on first impressions. After viewing the website for up to one minute,

the participants completed a questionnaire, and then answered similar questions about the next three websites. The authors' objectives was to analyse whether colour might provide an emotional bonding, and their results demonstrated that colour increased motivation, emotion and "persuasion" in web design (Swasty & Adriyanto, 2017).

2.5.3 Interactivity

Interactive technologies provides user engagement and interaction with an application (Antona, Savidis, & Stephanidis, 2006). Buttons, hyperlinks and multi-media also provide interaction between the user and the application, making the product both engaging and useful. An interactive application improves student learning and provides feedback to students. Studies show that interactivity accelerates learning time, affecting overall student behaviour and progress. In "*Evaluation of the Interactivity of Web-Based Learning Systems: Principles and Process*", interactivity in a learning environment involves interaction between student to teacher, student to content, or student to student (Evans & Sabry, 2003). Each interaction includes the use of web technologies and a computer in which the user must input data or respond to a feedback system in order to learn a subject. This type of interaction between the user and the system requires three types of action, which the authors described the process as a three-way model of interactivity (3-WMI) consisting of (1) the system initiates a request with the learner (user), (2) the learner (user) inputs data as a response to the system, and (3) the learner (user) waits to receive system feedback from the inputted data (Evans & Sabry, 2003).

The authors referred to these three actions as an iterative process that repeats itself. While the process suggests a learning platform through interactive engagement, the study did not mention what happens when the learner incorrectly performs tasks? When does a user become an expert? Or, when does a user becomes proficient at using the application? These questions are important when interacting with an online map, especially if the user experiences difficulty using the online map, suggesting that the user might still be a learner for quite some

time. And, if a user is “new” to the application, then the interaction might not be as good as intended if the user is still not a proficient user, especially after much time has passed since using the web application. This suggests that design aspects are necessary in ensuring that the application is functionable for correct user behaviour and for new users, as they grow in knowledge while learning the new system.

2.5.4 Visibility

In information technology science, visibility refers to the visual displays of information, objects or links (Bhutkar, Ray, Katre, & Deshmukh, 2011), and is an important user interface design aspect especially in medical care. For example, in the design of patient monitoring systems in the intensive care unit (ICU), system designs should have readable and identifiable messages, icons, symbols and numbers on medical user interfaces. The authors asserted that the colour for the interface, the shape of the icons, or even the physical location of where the devices are placed, should provide good visibility for all users (Bhutkar et al., 2011).

Visibility is one of Nielsen’s (2000) heuristics. This heuristic principle focuses on keeping users informed about the system and the user’s interaction with the system. One example would be through system feedback, which provides a visual cue, such as an hourglass image, or a text image advising the user of the amount of time the system is taking to perform and complete a request. However, while users noticed objects and features in good interfaces, a lack of visibility in other interfaces were also noticed by users. Nielsen (2000) stated that it would take just five students to sufficiently discover 75% of its usability issues with an interface (Nielsen’s 2000, as cited in Yushiana & Rani, 2007). Also, in a study by Yushiana and Rani (2007), ten participants evaluated the WebPAC user interface and found that eight of the ten participants agreed that the interface had visibility properties of 1 to 14. However, six of the participants found that the interface was lacking appropriate system feedback messages to users, such as advising users of system delays. Five of the participants commented that error

messages were found in different areas of the page, when they should have been consistently displayed in the same place throughout all the pages of the interface (Yushiana & Rani, 2007).

2.5.5 Gamification

Web developers use gamification as an alternative method to attract and recruit customers to use their products. It is especially common amongst marketers who often uses crowdsourcing strategies to source information, heavily relying on the motivation and the willingness of participants to perform crowdsourcing tasks (Sigala, 2015). For example, in, “*Gamification for Crowdsourcing Marketing Principles: Applications and Benefits in Tourism*”, Sigala (2015) reviewed various companies within the travel industry that implemented gamification elements of rewards, point-scoring, and game challenges in the design of their interfaces. While Sigala described how companies used the gamification elements in business, the effectiveness of using gamification elements were not mentioned. So, then why would companies employ gamification elements in their user interface design? It is because gamification, (which was initially about systems design in games), supports the self-determination theory of three primary needs of “autonomy, competence, and relatedness” leading to “autotelic behaviours” (Hamari & Xi, 2019). Autonomy satisfaction is about the need for learning new skills and wanting to improve oneself (Hamari & Xi, 2019), and relatedness is a feeling of belonging.

Authors Hamari and Xi (2019), tested three different gamification features of immersion-related, achievement-related, and social-related features and found that immersion-related gamification features are associated with autonomy. While achievement-related gamification features provided all types of need satisfaction and is a strong predictor of autonomy and competence, social-related gamification features were positively associated with autonomy, competence, and relatedness. Methods included measuring interaction with

gamification features (immersion, achievement, and social-related features) and intrinsic needs of autonomy, competence, and relatedness (Hamari & Xi, 2019).

According to Sigala (2015), businesses have gamified their processes to further innovate their products. However, while this might be encouraging, measuring the effectiveness of gamification and how this translated to any improvements towards the learning process of users, or even how it affected business profits, is still unknown. While there are still some gaps in how gamification helps businesses or users, gamification does have some advantages such as helping users' learn a new skill, or motivate participants through its points-scoring systems and rewards-based incentives.

2.6 Crowdsourcing

Finding people's favourite places includes attracting visitors to a survey through crowdsourcing. Crowdsourcing is the method of outsourcing tasks to the "crowds" through recruitment of paid or unpaid volunteers. To recruit volunteers, they need to be given task descriptions and they need to be able to access the survey from a web application.

In the "My Favourite Place" web application, the website included one task description on the home page, asking users to complete the survey. To find participants, regular social media postings were made on Facebook, Twitter, Instagram, LinkedIn, Reddit, Pinterest and Tumblr. The posts informed users of a favourite places-led project and asked users to complete the survey. Using social media on a crowdsourcing platform, the posts were directing the "crowds" to the website so that they could complete the online survey.

The survey included an interactive map and a text box asking respondents what is their favourite place and why. The interactive map was a Leaflet map that could retrieve coordinates of favourite places. Leaflet (Agafonkin, n.d.) is an open source software tool that offers a range of products for map making. Leaflet writes java script codes making the maps user-friendly

for users, web developers, and the public. By embedding a Leaflet map into the survey form, the project was also engaging in VGI crowdsourcing-type activities.

Companies often use crowdsourcing projects to source customer feedback, knowledge, and understandings of topics important to both the company and customers (Hossain, 2012; Morschheuser, Hamari, Koivisto, & Maedche, 2017). Since most volunteers are generally not paid for this type of work, organizations often find it difficult for them to retain volunteers who lack motivation while performing crowdsourcing tasks (Dykes, Stock, & Medyckyj-Scott, 2018). The challenge of motivating people to respond to an online survey is an ongoing problem for crowdsourcing activities.

2.6.1 Motivation and Crowdsourcing

Motivation is an emotion that a person feels when performing a task. Humans either want to do it or not. The outcome is dependent on motivation levels on how they felt about the task while performing it. According to Hossain (2012), people will participate in crowdsourcing depending on how the tasks would make them feel, or whether the rewards they will receive would be worth the tasks they performed. To understand motivation, it is noteworthy that motivation is both intrinsic and extrinsic. Intrinsic motivation is how users feel about a task without expecting any return though still experiencing enjoyment, satisfaction and happiness from performing the task. Extrinsic motivation influences how participants perform a task with an expectation of a reward, such as in the form of monetary payment, recognition, benefits, or a prize (Hossain, 2012). In some crowdsourcing projects, gamification elements appeal to the extrinsic motivations of participants by giving them opportunities for earning points, or seeing their progress on a scoreboard. Extrinsic motivations included earning trophies, labels or badges, even providing incentives for winning or earning gift card vouchers, or money.

Motivation is also demonstrated by the participant's willingness to perform and complete the task (Gómez-Barrón, Manson-Callejo, Alcarria, & Iturrioz, 2016). Many findings

suggests that intrinsic motivation generates creativity on crowdsourcing projects (Hossain, 2012; McGraw, 1978). Intrinsic motivation moves one to seek reward, money, prize, and recognition. Researchers have also observed that extrinsic motivations does conflict with other motivational behaviours (Frey & Jegen, 2001; Baez, Mosquera, & Stobäus, 2017).

Task descriptions are effective in motivating respondents to complete the online survey. Implementing task descriptions in this crowdsourcing project was very important in the design of the study's web application. The task description that was explained to users on the website, demonstrated the project's objectives of finding favourite places through crowdsourcing and volunteered geographic information (VGI) activities.

2.7 Volunteered Geographic Information (VGI)

Volunteered geographic information (VGI) is the sharing of geographic content and the sharing of experiences with people (Gómez-Barrón et al., 2016). In a study conducted by Langley, Messina, and Moore (2017), regular citizens with some or no scientific training volunteered in a VGI crowdsourcing project called participatory mapping (Langley et al., 2017). Participants mapped locations on a shared map for researchers to collect, test and analyse spatial data. Volunteers shared their location through use of a VGI application, or with enabled GPS (Global Positioning System) functionalities on a smartphone, laptop or tablet.

The sharing of VGI content captures geographic events via live-streaming enabling tracking, reporting or monitoring. Events captured through VGI activities included updates on bushfires (Haworth, Whittaker, & Bruce, 2016), floods (Tzavella, Fekete, & Fiedrich, 2018), the migration of refugees (Curry, Croitoru, Crooks, & Stefanidis, 2017), earthquakes (Ahmouda, Hochmair, & Cvetojevic, 2018), and disease outbreaks such as the COVID-19 pandemic (Zhou, Su, Pei, Zhang, Du, Luo, Cao, Wang, Yuan, Zhu, Song, Chen, Xu, Li, Ma, Jiang, Yan, Yi, Hu, Liao, & Xiao, 2020). VGI capabilities had also helped organizations track human movement (Senaratne, Mobasheri, Ali, Capineri, & Haklay, 2016; Jurdak, Zhao, Liu,

AbouJaoude, Cameron, & Newth, 2015), air pollution (Gupta, Pebesma, Degbelo, & Costa, 2018), social injustices, and inequalities (Beischer, Cochrane, Corbett, Evans, Gill, & Millard, 2015).

VGI activities are used frequently in scientific research, such as eBird's software application called "Merlin" which reports bird sightings (The Cornell Laboratory of Ornithology, 2018), or the "Survey Mapper" web application that reports coordinates of people's favourite parks (Gray et al., 2015). These examples show that there were important factors in obtaining information. Firstly, the details of the geographic event had to be recorded. Secondly, coordinates of the location was sought. Thirdly, the tool used was a VGI application. And, fourthly, participants had to use a map for sharing locations.

VGI is strongly linked to crowdsourcing because of the technologies that allow volunteers to contribute spatial data on a shared map. Many organizers and researchers confirm that VGI technology is effective when motivated people contribute a response (Gómez-Barrón et al., 2016). The use of web technologies has seen a decline in the use of paper maps which raises the question of whether online maps are more effective than paper maps in VGI activities?

In "*Assessing the application and value of participatory mapping for community bushfire preparation*", the authors used two different maps, paper-based maps and an online map using GIS functionality (Haworth et al., 2016). The authors created base maps to match the details on paper-based maps, trained the respondents to identify vulnerable areas for bush fires, and then asked them to draw those areas on the paper maps. Their research aims focused on using maps and map sharing, creating an awareness of bushfires, encouraging social connectedness, and creating methods of risk reduction.

In their assessment, the authors found that paper maps were not reliant on electric power and internet access, and that it was a good method for discussion amongst groups of people.

Also, the study concluded that paper maps encouraged users to sketch their drawings on the map, providing good user engagement. However, the authors found that the disadvantages of using paper maps was having to deal with illegible handwriting, that the paper maps was subjected to damage or getting lost, and that they had missed the comforts of technological functions found in digital maps, such as being able to zoom, pan, or scale on the map.

2.7.1 Digital Maps

Crowdsourcing projects includes VGI and the use of online maps which can greatly help volunteers. Digital maps provide better imagery of locations, features, and terrains since the digital technology has a higher resolution than paper-based maps (Haworth et al., 2016). Digital maps is also accessible to those who have internet access, enabling users to maintain their online maps for viewing, editing, and updating. Digital maps has storage, in which authors can save their own maps online and users' could either make their maps available to others. However, using maps can be complex. The advantages of using maps in crowdsourcing activities is its ability to locate places, people, objects, animals, natural disasters, warfare, or viruses relatively quickly and precisely.

2.7.2 VGI Methods

This section reviews two examples of software applications that are used to find geographic data. The first example is a web application, and the second example is a mobile application.

2.7.2.1 *Participants tells Survey Mapper their favourite London Park.*

The Centre for Advanced Spatial Analysis (CASA) created a survey through "Survey Mapper", a web application built on the MapTube platform that was collecting geographic locations and responses to survey questions (Gray et al., 2015). Survey Mapper combined visualization of choropleth maps and responses to survey questions on a website that was different from other existing survey platforms at the time, such as Survey Monkey. The maps were "2 point-based

visualisations” (Gray et al., 2015), consisting of a draggable marker that dropped onto the map, retrieving latitudinal and longitudinal coordinates and a heat map of locations and responses. The BBC approached Survey Mapper to help them set up a survey about anti-social behaviour in the BBC Look East region, and had collected 6,902 responses across three evenings.

The Greater London Authority also approached Survey Mapper asking them to build a survey about safety at parks in London. For example, the survey conducted by the Greater London Authority, asked participants their views on London parks with the question, “How satisfied or dissatisfied are you with the quality of your local parks and green spaces?” (Gray et al., 2015, p.167), as well as twelve other survey questions. It was anticipated that the respondents would not know the name of a London park, in which case the authors added a dataset of London parks allowing users to select their favourite London park.

The advantages of Survey Mapper was its ability to conduct online surveys with shared locations closer to real-time. The map features allowed people to use the map with ease and helped them find their favourite London park. The study also demonstrated the effectiveness of using a web page that provided good map visualization. The web application afforded greater accessibility to more internet users, thereby receiving a greater response rate. The method of using a VGI web application would be more appropriate for this study, especially since social media postings, if successful, could generate a lot of online responses across a few weekends.

2.7.2.2 Participants tells FotoQuest their favourite location.

A second example is the mobile application “FotoQuest Austria” which was used to report on places and landscapes. Using a crowdsourcing platform, the authors designed the mobile application to collect data from the crowds based on the idea of “geocaching” (Bayas, See, Fritz, Sturn, Perger, Durauer, Karner, Moorthy, Schepaschenko, Domain, & McCallum, 2016). Players gain points for reaching a location, taking photos and recording the land use, and land

cover. Similar to the Pokémon GO application, the FotoQuest Austria mobile application directed users to find the locations displayed on the screen.

To use the application, a player opened the application and saw his current location and the surrounding areas. The screen showed locations called “quests” in yellow and blue (Bayas et al., 2016). If the location was blue, then this meant the location had not yet been visited and worth 100 points. Players were encouraged to take a photo of the location. On the other hand, if the “quests” was yellow, then it would show up to five people had already visited these places. Any more than five people, then the colour red was shown in the places they had visited. FotoQuest Austria was a VGI application focusing on photos for land use and cover. The gamification elements made it more engaging for users, as also the use of colours to identify different “quests” (Bayas et al., 2016).

However, the locations was a dataset uploaded into the application and the locations were chosen by the creators because these locations were of interest to them. Using a specified dataset uploaded by the researchers in this study, would not be appropriate for finding favourite places although using gamification elements would be enjoyable and an interesting design aspect for the twelve experimental interfaces that would be used in Survey One.

2.8 Summary of the Literature Review

The literature review covered several topics discussing favourite places, sense of place, user interface design, visibility, colour, interactivity, crowdsourcing, VGI, gamification and various methods of collecting data on shared digital maps. A consideration of two examples of VGI applications or VGI software tools was discussed, such as the web applications of Survey Mapper and FotoQuest Austria, which demonstrated that VGI applications can be designed with fun gamification elements to help make the data collection process more enjoyable and engaging.

In particular, the literature review addressed key issues focusing on the following points:

- Favourite places in adults vary greatly to children and adolescents. For example, adults experienced various forms of stress and used favourite places as places to relax, rejuvenate, restore, reflect and self-report on one's thoughts and emotions. Children, on the other hand, associated favourite places for play and did not view favourite places as places of self-reflection. Adolescents isolated themselves, and would turn a bedroom into a favourite place just to avoid monitoring by older adults.

These age comparisons of favourite places show that the perception of favourite places varies and may not necessarily be a favourite to all. For example, some of the favourite places of children and adolescents had defined boundaries, such as a house, or rooms within the house, school grounds or a school hall, and would not necessarily be a favourite place for adults.

- Objections as to whether physical landscapes or natural woodland settings are therapeutic to all people were insightful as they revealed people's feelings of fear in some natural settings, such as the fear of being attacked, getting lost, fear of the dark because of shaded areas in the woodlands that are generally hidden, and where less light might shine through.
- People's views of favourite places can change when affected by sharing secret places through tourism, moving into negatively valenced neighbourhoods, or when natural physical landscape changes either through man-made destruction or natural destruction.
- People's need for space and place is a relationship between people-to-places or places-to-people.
- Existing literature on VGI projects showed that respondents and the public needs to correctly utilize maps, identify locations, and provide reliable coordinates of places.

- Researchers can source respondents through crowdsourcing, directing users to the online survey.
- Gamification is one way of motivating respondents to participate in a crowdsourcing project.
- Including task descriptions that are clear and simple in the user interface would encourage better task completion by respondents participating in a research project.
- A web application much like Survey Mapper which had a map and an online questionnaire is ideal for VGI-type activities, and would help retrieve coordinates of favourite places for this research project.
- Methods used by researchers such as Brown and Raymond (2007) who used place statements to measure place values on a Likert scale would help this study.
- The method of evaluating four different websites to test the user design variable colour, such as in the study with Swasty and Adriyanto's (2017), would help this study determine user-friendly interface design principles.

Reviewing these methods, frameworks, design principles, and applications provides useful guidelines in determining the best approach in finding out peoples favourite places and why. Finally, the literature review explained the how, what, and why processes of finding favourite places. It also provided interesting points across many disciplines that helped this study decide what to build, how to structure the online survey, whether to include task descriptions on the website, which design aspects would be useful for the web application, and which research methods would be most suitable for collecting coordinates of geographic data from people in the search for favourite places.

3 Research Methodology

The Research Methodology consists of four parts covering three surveys and one pilot study. In Section 3.1, the research methods, ten design factors, and the design of Survey One will be explained. In Section 3.2 the pilot study, methods and its feedback from experts and users will be reviewed. A consideration of the 16 place statements for Surveys Two and Three, and the setting up of the web application and the server within the Massey University network will be discussed in Section 3.3. Finally, in Section 3.4 the secondary study in Wales will be analysed.

The four parts of Section 3 are as listed below:

1. Part A: Survey One - Preliminary Study
2. Part B: Pilot Study
3. Part C: Survey Two - Main Study in New Zealand
4. Part D: Survey Three - Secondary Study in Wales

The preparation for all three surveys are discussed in Section 3, including the reasons why certain methods were appropriate for the study.

3.1 Part A: Survey One - Preliminary Study

The objectives in finding people's favourite places and directing them to the website application required preliminary work towards the designing and building of the "My Favourite Place" website application. Specific user design principles needed to be established to ensure the website would attract respondents and prompt them to complete the online survey. Furthermore, a set of criteria for the interfaces would need to be created, consisting of ten design factors that would help improve the quality and quantity of responses from the public.

The ten design factors consists of the following variables:

1. Colour

2. Task Descriptions
3. User Engagement
4. Form Elements
5. Interactivity
6. Easy to Use
7. Intrinsic Motivations
8. VGI Map Design
9. System Feedback
10. Gamification

The interfaces and maps created for Survey One were experimental tools to determine user preferences with colour, interactivity, buttons and maps. The interfaces were used as a preliminary method to collect data from survey participants about specific design principles. Secondly, the data collected was used as a guideline in creating the final build. Thirdly, the findings of Survey One helped answer the first research question.

3.1.1 Research Methods

In Survey One, we applied two research methods that focused on user interface design principles used by other researchers such as:

- a) Swasty and Adriyanto (2017) who used four websites that implemented five design principles of clarity, layout, hierarchy, emphasize, and navigation, in determining a connection between colour and consumer purchasing behaviour.

In Swasty and Adriyanto's (2017) study, the authors objectives was to create a website through persuasive design. They recruited one hundred participants to analyse four websites, specifically reviewing the user interface design for each website. Participants then ranked, in

the order of importance, which design principle they felt would be considered important when building a good website. The survey measured the websites based on first impressions in which the participant reviewed the website for up to one minute, and then completed the questionnaire. After answering the questionnaire, the participants then reviewed and completed the same questions for the next three websites.

Swasty and Adriyanto's (2017) methods of reviewing each website for up to a minute would not be sufficiently long enough for participants in this study, since they would need to interact with several experimental web interfaces. Instead, participants of Survey One would need to review six interfaces each, for up to an hour. Also, the method of using five principles to isolate important factors for their study was a good approach. However, in the search for favourite places, it was decided that a set of criteria of ten design factors would be implemented throughout the twelve experimental interfaces that would be used in Survey One.

- b) Sik-Lányi (2018) proposed a conceptual model suggesting that colour choice might affect corporate identity, corporate branding, and brand identity.

Sik-Lányi's (2018) study focused on conducting interviews with participants, asking them about images and colour and whether colours would make a difference in corporate branding and awareness. The authors based their assertions on colour from a theoretical study who proposed that colours have positive and negative associations (Perry & Wisonm, 2003, as cited in Chang & Lin, 2010) affecting stimuli and the emotions. Personal and cultural experiences affect how people perceive colour (Sik-Lányi, 2018), and the choice of colour can create consumer awareness of brands or the messages they convey. The authors also asserted that colour is important in text and can affect readability. In applying Sik-Lányi's (2018) research

methods, participants were asked in Survey One which colours they would prefer on buttons, text, background, maps, and how colours made them feel.

3.1.2 Twelve Interfaces

Twelve interfaces (see Appendix M) was chosen as the best tools to find out users preferences about design principles. Conducting an online survey is the most appropriate method for participants to interact with, making the website engaging. An online survey would make evident extrinsic and intrinsic qualities of the individuals participating in the survey.

People who participated in Survey One had the role as user-based “evaluators”. The word “evaluate” was used in the flyer advertising the experiment. The definition of an evaluator “is a person or system that makes a judgement about the value, importance or quality of something” (Macmillan Dictionary, 2009-2020). Their role as a user-based evaluator and a participant was largely by trial and error and the participants had to learn how to engage with the websites as they answered task-related questions, opinion-related questions, and evaluations of each interface.

The experimental websites were assigned to ten people who volunteered. Participants were then sent a survey link to one of four options, in which they reviewed six websites. In the first analysis, a comparative analysis of comparing pairs of two opposites to assert which interface was their preference would be conducted. For example, one website had colour and the second website had no colour. Or one website provided clear task descriptions and the other website did not. This type of analysis was suggested by Park and Lim (1999), asserting that a comparative analysis examines the preference of one website over another. The second analysis was to compare alternative websites in cases where users did not see the comparison but just the alternative. However, at best, Park and Lim (1999) concluded that user testing exhausted users’ ability to test, evaluate and perform tasks, making it difficult to obtain ideal results.

3.1.3 Creating a Set of Criteria for Testing

There are several ways an evaluation can be made. Park and Lim (1999) used two phases to test usability by firstly, establishing a pre-screening phase that was an expert-based evaluation and secondly, by implementing an evaluation phase evaluated by users. While this study did not recruit experts to test the twelve websites, the author and the supervisor used their knowledge in user interface design to pre-screen the survey questions.

As part of pre-screening the twelve interfaces, a set of criteria was created by listing ten design factors (Park & Lim, 1999) that would make the website effective. A set of criteria is important and can affect user engagement and the quality of contributions. The ten design factors were built into the experimental websites that were used in Survey One.

3.1.4 Ten Factors for User Interface Design

In Table 1, ten design factors were selected and implemented into the experimental interfaces. There is a claim for each design factor and the answer to these claims are listed in Section 4.1.2.2. These ten design aspects were tested in Survey One to help answer the study's first research question of which design aspect would make a user-friendly web application (see Section 1.8).

Table 1

Ten Design Factors

Number	Factor	Claim
1	Color	Colour promotes emotional bonding between user and the product (Swasty & Adriyanto, 2017).

		<p>Colour can stimulate user purchasing behaviour (Cheng et al., 2019).</p> <p>Colour that is likeable and pleasing to viewers are more tolerated by users (Preece et al., 2015).</p> <p>Stimulating colours indicates an action, prompting a response (Swasty & Adriyanto, 2017).</p>
2	Task Descriptions	<p>Task descriptions should be visible (Finnerty, Kucherbaev, Tranquillini, & Convertino, 2013).</p> <p>Visibility means that users know what is expected of them, know where they are going and what to do next. (Preece et al., 2015, p. 501).</p>
3	User Engagement	<p>Interesting, task complexity, and search behaviour affects user engagement (O'Briena, Arguellob, & Capra, 2020).</p>
4	Form Features	<p>Radio buttons, check boxes, text fields, and text area box.</p> <p>Creating simple forms and designing an expressive forms-based interface (Jayapandian, 2008).</p>
5	Interactivity	<p>Interactivity helps cognitive absorption, comprehension, elaboration, memory, and knowledge gain (Yang & Shen,</p>

		2018). Website interactivity is defined as interaction between the application and the user (Yang & Shen, 2018).
6	Simple to Use	The interfaces should be easy to use (Preece et al., 2015, p. 501).
7	Intrinsic Motivation	Motivation and intrinsic task-oriented descriptions help increase participation (Finnerty et al., 2013).
8	Map Design	<p>Usability of the maps such as hover, map markers, intrinsic motivations (behaviour) of clicking on markers, icons, and pop-up boxes.</p> <p>Map design and usability of a VGI application can help towards the success of a VGI crowdsourcing project and encourage, motivate users to contribute data.</p> <p>The simplicity of the design makes it easier to use (Brown, Sharples, & Harding, 2013).</p>
9	System Feedback	This is also part of visibility and relates to system feedback. Users should be kept informed through appropriate and fast system feedback (Preece et al., 2015, p. 502).

10	Gamification	Points-based system, leaderboards, labels, badges, awards, challenges, story, labels, and avatars (Johnson, Deterding, Kuhn, Sotyanov & Hides, 2016)
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3.1.5 Creating 12 Experimental Interfaces

To answer the first research question, “What design aspects in user interface design would produce a user-friendly web application?”, it was decided that twelve websites implementing ten design factors would be the best method in finding out users’ preferences and making the final web application user-friendly. The preliminary work of building twelve experimental interfaces worked towards finding favourite places (see Appendix B). Hostinger, a webhosting service provider (Hostinger, n.d.), hosted the website used for Survey One which is located at www.myfavouriteplace.xyz. Hostinger also provided a database that was connected to the website.

3.1.6 Designing Survey One

The survey took place online in a controlled environment in which the author assigned participants six interfaces each for comparison between two opposite interfaces, alternatives, or similarities (MIT, 2016). That is, two interfaces opposite to the other, two interfaces that are alternative designs, and two interfaces that have some similarities in their design variables.

A survey is a questionnaire (MIT, 2016). Survey One consisted of questions and task descriptions. Two types of questions were carefully used. These were task descriptions (TD) and opinion-related (OR) questions. Task descriptions require users to do things, such as count, zoom, search or to watch a video. Opinion-related questions are questions that asked users their opinion on how they felt, and what they liked or disliked. Opinion-related questions were

also sought to determine how the participants in Survey One felt about design features, colour, and interaction with maps.

3.1.7 Dividing the Versions into Sections

The twelve interfaces were divided according to Sections 1 to 12 as demonstrated in Table 2. Twelve sections matched twelve experimental web interfaces and consisted of a series of survey questions pertinent to answering the first research question of which design aspects in a user interface would best produce a user-friendly web application. All of the versions had an assigned letter of the alphabet and was referred to as Interface A or Interface B to remove any biases from the participant. This was also done to prevent the participant from knowing which version they were evaluating. In this way, the responses from the participant for each interface was completely without prior knowledge.

Table 2

Dividing the Interfaces

Section	Description	Interface	Number of Questions
Section 1	Standard	A	3 + 1 evaluation = 4
Section 2	Colourful	B	6 + 1 evaluation = 7
Section 3	Non-Colourful	C	7 + 1 evaluation = 8
Section 4	Interactive	D	6 + 1 evaluation = 7
Section 5	Non-Interactive	E	3 + 1 evaluation = 4
Section 6	Visible	F	2 + 1 evaluation = 3
Section 7	Non-Visible	G	3 + 1 evaluation = 4
Section 8	Incentive Scheme 1	H	9 + 1 evaluation = 10
Section 9	Incentive Scheme 2	I	7 + 1 evaluation = 8

Section 10	Incentive Scheme 3	J	5 + 1 evaluation = 6
Section 11	Map Content	K	8 + 1 evaluation = 9
Section 12	Key Content	L	8 + 1 evaluation = 9

3.1.8 Dividing the Interfaces into Options

The interfaces were then divided into four options to make the surveys more manageable for participants as shown in Table 3. Each interface was reviewed separately to the other, and the participants answered the survey questions to make comparisons between interfaces of opposites, alternatives and similarities.

Table 3

Survey Options

Option A	Option B	Option C	Option D
43 Questions	56 Questions	53 questions	54 questions
B, C, D, E, F, G	K, A, L, H, I, J	F, E, K, B, H, A	G, D, L, C, I, A
Interface B Colourful	Interface K Map Content	Interface F Visible	Interface G Non-Visible
Interface C Non-Colourful	Interface A Standard	Interface E Non-Interactive	Interface D Interactive
Interface D Interactive	Interface L Key Content	Interface K Map Content	Interface L Key Content

Interface E Non-Interactive	Interface H Incentive Scheme 1	Interface B Colourful	Interface C Non-Colourful
Interface F Visible	Interface I Incentive Scheme 2	Interface H Incentive Scheme 1	Interface A Standard
Interface G Non-Visible	Interface J Incentive Scheme 3	Interface A Standard	Interface I Incentive Scheme 2

Also, the four options allowed the participants to make a comparative analysis between pairs of contrasting interfaces. Or an analysis of alternative interfaces in order to explain their differences or similarities between each interface.

3.1.9 Using Qualtrics as the Survey Tool

The survey tool, Qualtrics, a survey software used by Massey University, was used to host the questionnaires for Survey One. Qualtrics offers survey templates and a library of one hundred and more survey questions (Qualtrics, 2020). Questions were numbered according to options A, B, C, D. This was to firstly, conduct a comparative analysis by comparing interfaces and secondly to give participants only 6 websites to prevent exhaustion. Seven participants had survey questions that were not randomized, and three participants had randomized survey questions. Randomized questions were sought to compare participant's answers of those who had randomized surveys and those who did not have randomized surveys.

To avoid duplication, participants were assigned an option whether A, B, C and D by the researcher so that they could complete the survey as seen in Table 4.

Table 4

Number of Participants Per Option

	Option A	Option B	Option C	Option D	Total
Participants	2	3	2	3	10 Participants

All options consisted of some six interfaces for review by the participants in Table 5.

Table 5

Participants and Options

	Option A	Option B	Option C	Option D	Total participants
Interface A		3	2	3	8
Interface B	2		2		4
Interface C	2			3	5
Interface D	2			3	5
Interface E	2		2		4
Interface F	2		2		4
Interface G	2			3	5
Interface H		3	2		5
Interface I		3		3	6
Interface J		3			3
Interface K		3	2		5
Interface L		3		3	6

The survey consisted of questions relating to socio-demographics (SD), task descriptions (TD), opinion-related (OR) questions. Also, survey links provided participants with instructions on the survey, ethics, and evaluations in each option (see Table² 6).

Table 6

Questions Per Option

Options	SD	TD / OR	Instructions & Ethics	Evaluations	Headings	Total
Option A	3	27	4	3	6	43
Option B	3	40	4	3	6	56
Option C	3	34	4	6	6	53
Option D	3	35	4	6	6	54

3.1.10 Survey Participants Recruitment

Survey One was conducted between the 31st of October 2019 to the 28th of January 2020. Emails were sent to friends, work mates, relatives, and other school students. Flyers were also distributed locally at Massey University, Albany Campus. On another occasion, the Avondale Westfield Shopping Mall carpark was used as a place to distribute flyers, as well at the carpark of New Zealand School of Education, a private tertiary education provider located at Manukau, Auckland.

3.2 Part B: The Pilot Study

A pilot study occurs prior to the launch of the final product (Preece et al., 2015). The software application undergoes testing by participants who interact with the application as a “trial run”. The pilot study is an inexpensive and useful method to test questionnaires, user interface design

² See Appendices G, H, I, and J for the entire list of survey questions for each option.

factors, and the web application, to assess whether the participants have had any issues with the software. After the results of Survey One was analysed, the data was used to create the final build of the “My Favourite Place” application. The new website was then tested on a pilot study which took place after Survey One.

3.2.1 Research Methods for the Pilot Study

Personal statements elicit a response from users who freely express their views on how they felt about places and their reasons for liking or disliking specific places. In preparing the website, a careful consideration was made to finalize which personal statements would be included in the first survey. Although participants in Survey One would not be using the personal statements table in the first website, the selection of 16 place statements would be used during the pilot study, and therefore the selection process was decided upon very early on in the study.

Two research methods were used in finding out people’s favourite places. The methods are as follows:

- Brown and Raymond (2007).

In this study, authors conducted a survey to find out the relationship between place attachment and landscape values by using a map and 15 place statements. Each place statement had a value such as a historical, cultural, spiritual, or scenic value. The participants in their study had to rate against a 5-point Likert scale through use of a dot and to indicate their feelings about six locations on a map. The dots were part of a points system. The larger the dot, the greater the points, which would indicate the amount of attachment the participant felt towards that location. In the “My Favourite Place” application, Brown and Raymond’s method (2007) of using place statements would be used in the study and would be measured against a 7-point Likert scale.

- Brown and Weber (2012).

The authors were interested in providing participants with mapping activities. The authors gave participants a map and then participants were told to drag and drop a map marker on a place they liked. The map markers represented different spatial attributes relating to thirty landscape values, or park experiences (Brown & Weber, 2012). Participants chose a spatial attribute of their preferred map marker and then dropped the marker onto the map. Participants were also asked about their familiarity of the place such as conservation areas in Otago and Southland, New Zealand (Brown & Weber, 2012). The maps used in their study was Google Maps which allowed users to zoom in, and then drop the map marker onto the map.

Brown and Weber's (2012) methods of asking participants to map their favourite place on an interactive map and then share why they liked that place was also used in the study. A Leaflet (Agafonkin, n.d.) map with java script functions allowing users to click on the map and retrieve the latitudinal and longitudinal coordinates of locations was embedded into the online survey form.

3.2.2 SUS Scores for the Pilot Study

An email was sent to friends, colleagues, fellow students, and academic staff, inviting them to participate in the pilot study. Three people were selected and a web link of the new website was emailed to them. The participants were asked to review the website, interact with the map, complete the online survey form, and submit their responses to the database. Participants were then asked to evaluate the website by completing an online SUS Evaluation sheet in Qualtrics.

SUS (System Usability Scale) is an evaluation method that rates the usability of an interface based on a questionnaire consisting of 10 questions (Measuring U, n.d.). SUS is scored against a 5-point Likert scale, with 1 being "Strongly Disagree" to 5 being "Strongly Agree" (Gunawardhana, 2017). In Table 7, the results of the SUS evaluation scores for the new website shows an overall SUS score of 85.0, or an A+ Grade (Sauro, 2018).

Table 7

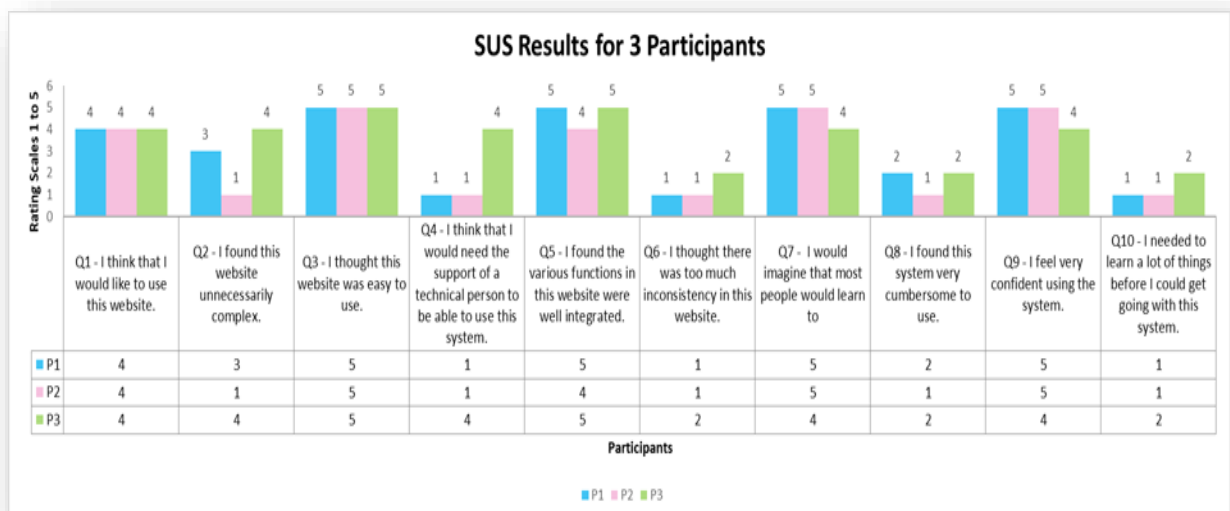
SUS Calculation Scores : Pilot Study

SUS Calculation											
Participant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SUS Score
P1	4	3	5	1	5	1	5	2	5	1	90.0
P2	4	1	5	1	4	1	5	1	5	1	95.0
P3	4	4	5	4	5	2	4	2	4	2	70.0
Overall Grade											85.0

In Figure 6, the bar graph shows the SUS score points for a total of 10 questions completed by 3 participants after they had reviewed the new “My Favourite Place” website.

Figure 6

SUS Scores : Pilot Study



3.2.3 Feedback from the Pilot Study

The pilot study web link was sent to other students, work mates and relatives. Feedback included other key stakeholders from those within Massey University and outside Massey University who have an in depth understanding of the cultural eco-system. Some of the feedback included making the following changes:

- Remove the references at the bottom of the “Favourites” page and have them listed on a separate page.
- Modify the wording of some places statements to correct the grammar.
- Randomize the statements in the table array using a random shuffle algorithm.
- Include an incentive to do the survey by showing users on the home page a cluster map of locations people had thus far submitted.
- The “Favourite” form to consist of four parts, instead of the existing three sections.
- Add another question to step 3 that asks, “Are you a resident or citizen of NZ?”
- Highlight the word “here” to stand out for people to read the consent terms.
- Prevent the latitude and longitude field boxes from being edited using the “read only” function.
- Add a “required” function for field boxes requiring compulsory data input and ensuring an error message appears.

The feedback from peer reviews demonstrated that a pilot study is useful. The list above shows the modifications required to the application to improve the overall user’s experience. It also helped towards the research of finding people’s favourite places through use of an interactive map and online form.

3.3 Part C: Survey Two - Main Study in New Zealand

As part of the main study in New Zealand, Survey Two was instrumental in finding favourite places, correlations between sense of place (SOP) values, preferences for SOP values, and reasons why people like favourite places more than others.

3.3.1 Research Methods for Survey Two

Two research methods from Brown and Weber (2007) were used for Surveys Two and Three. The researchers in this study provided participants with a map, and participants were asked to identify six places that was considered special to them. Dots were given to the participants who then had to rate twelve personal statements on a Likert scale of 1 to 5, 1 being “Strongly Agree” to 5 being “Strongly Disagree” (Brown & Weber, 2007). Each personal statement represented a value such as an aesthetic or scenic value, a heritage value or a wilderness value.

The objectives for Survey Two was:

- Provide respondents with an online map to identify their favourite place.
- Ask respondents to rate 16 personal statements on a 7-point Likert scale (Brown & Weber, 2007). Each statement would be linked to a value such as the wilderness, intrinsic or spiritual values.

After completing the online form, the answers made by respondents were added and then averaged to find the average Likert mean score which would help identify how respondents felt about their favourite place.

3.3.2 Choosing Personal Statements for the Website

A total of 31 place statements were initially selected in this study. These place statements were written by various place-based researchers in existing publications (see Appendix Z, Table Z1). After some agreement, the author and the supervisor agreed to a selection of only 16 place statements (see Appendix Z, Table Z2) that would be included in the survey form. The place

statements have a sense of place, or SOP value, and was then rated on a 7-point Likert scale to analyse the respondent's feelings about their favourite location. Choosing personal statements for the website provided peoples preferences for sense of place values, and their reasons for valuing favourite places more than others.

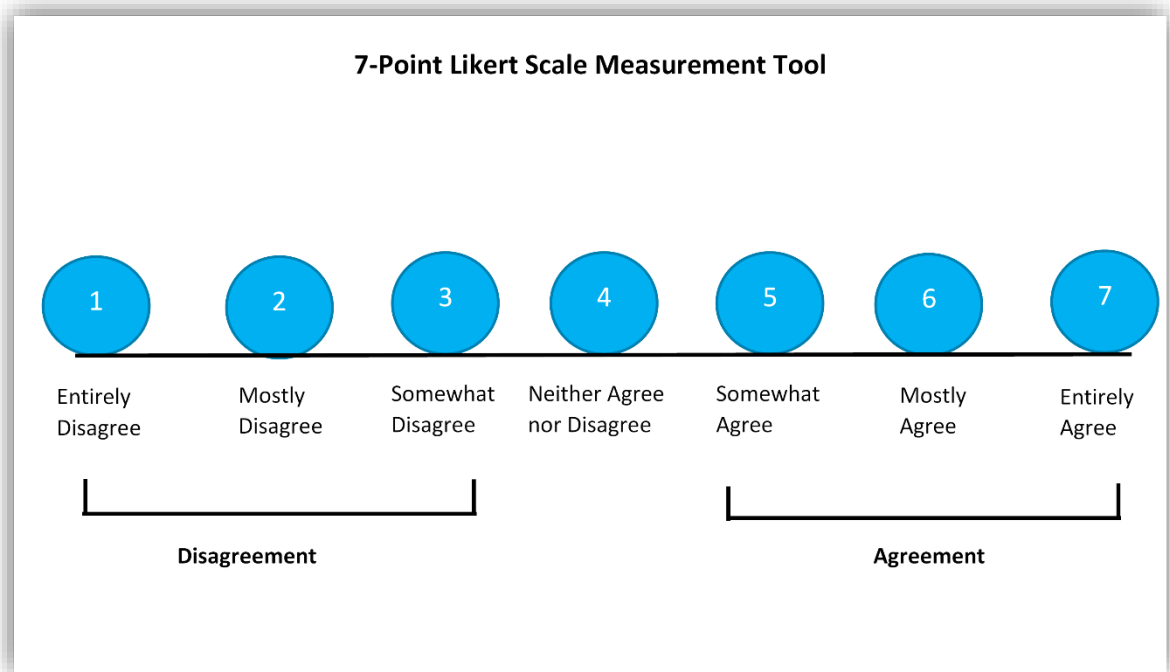
3.3.3 7-Point Likert Scale

In a study by Finstad (2010), the author found that a 7-point Likert scale provides better interpolation between two discreet values because it allows for more degree of agreement or disagreement by the participant rather than forcing the participant to choose between two values on a 5-point Likert scale that has less freedom of choice and a number that really does not reflect how they really feel about that question. According to Finstad (2010), the advantages of a 7-point Likert scale is that it does not limit the respondent to choose a point number they do not want to choose, unlike the 5-point Likert scale where there are less opportunities for respondents to answer as to how they really feel.

The measurement tool used for Surveys Two and Three was the 7-point Likert scale. The scale consisted of 7 point numbers (see Figure 7) between 1 to 7, that measured people's opinions and views on various topics, and in this case favourite places. The centre of the bar is the number 4 which is neutral. The high numbers of 5 to 7 are measured as positive agreement and the first three numbers are measures of negative disagreement. The Likert scale provides interpolation and offers a point scale that allows for more choices by participants.

Figure 7

The 7-Point Likert Scale Measurement Tool



3.3.4 Massey University Web Address

The website application needed a new web address associated to Massey University and the researchers. The new website address is located at <https://myfavouriteplace.massey.ac.nz/>

3.3.5 Windows IIS

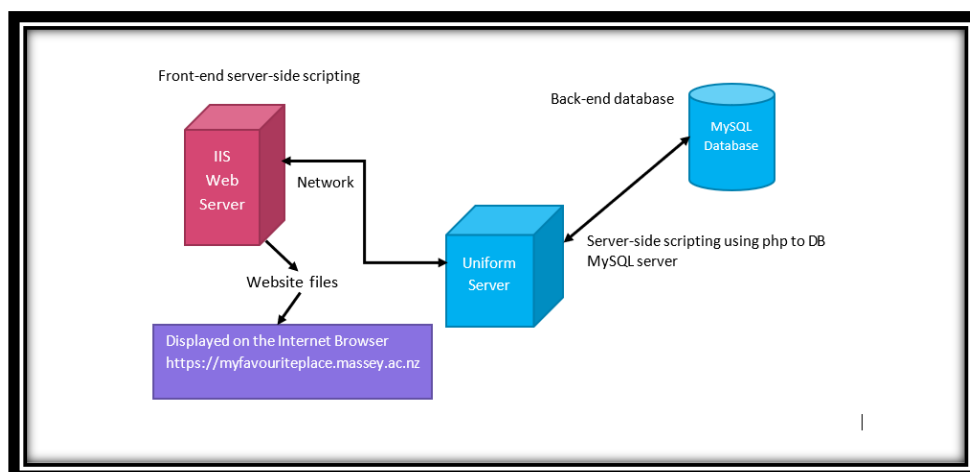
To set up the web server a Windows Internet Information Services (IIS) needed to be installed. Windows IIS is a web server software provided by Microsoft (Microsoft, n.d.). Windows IIS runs on Microsoft Windows operating systems and provides storage for web files. A web server acts differently to a server. A web server stores web files. When a web file is opened, the web file displays the content on a browser. This interaction between the web file and the browser occurs because the web server communicates with the internet browser, and the display occurs through compliance of web protocols relating to Hyper Text Transfer Protocol.

3.3.6 Setting Up a Server

Once the web server was installed, a Uniform server was installed since the uniform server runs on the Microsoft operating systems, is user-friendly, and simple to use (Uniform, n.d.). Connecting the Uniform server allowed the author to create a database using MySQL and perform server-side scripting at the back-end, while IIS allowed the author to conduct client-side scripting at the front-end. The diagram in Figure 8 shows how the front-end and back-end servicing and scripting occurred in the “My Favourite Place” web application. The installation and connecting of servers software from Massey University’s virtual machine enabled the hosting, storing, retrieving and maintenance of data collected for the “My Favourite Place” research study.

Figure 8

Servers for “My Favourite Place”



3.4 Part D: Survey Three - Secondary Study in Wales

The country of Wales has a land area that stretches some 210 kilometres from north to south and is about 160 kilometres across the southern part of Wales (Encyclopaedia Britannica, 2021). The population of Wales as of 2018, was over 3,138,000 and has a population density

of about 151.4 persons per square kilometre (Statistics for Wales, 2020). As part of Survey Three, a survey link was distributed to a few people in Wales through Welsh contacts known by the peer supervisor to which 14 people had responded (see Figure 9).

Figure 9

Map of Wales for “My Favourite Place”



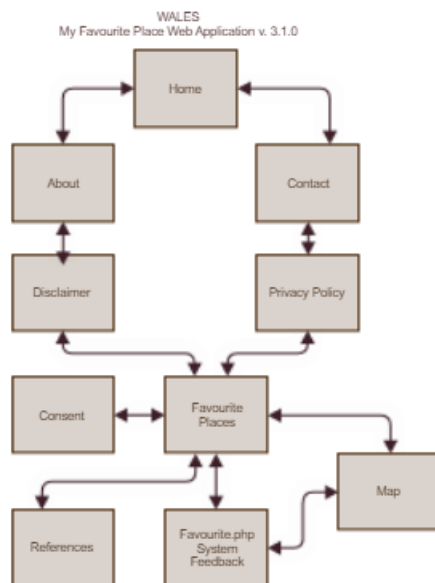
The objective was to compare a small data set from Wales with a data set in New Zealand. The objectives was to identify any similarities or patterns that might exist between the two countries. Another objective was to test whether a website version for Wales might appeal to people outside New Zealand and whether the “My Favourite Place” research project has the potential to attract visitors to its website in the future.

The goal of recruiting respondents in Wales was to have respondents access the “My Favourite Place” website in New Zealand, and then click onto the Welsh version. The respondents who accessed the Welsh website saw the exact website as the New Zealand version, though some changes were made to suit a Welsh audience such as displaying a map of Wales, and photos of Welsh sites on other pages of the website (see Appendix O). The site structure of the Wales website version of “My Favourite Place” website can be seen in Figure 10.

The process of completing the online form was similar to New Zealand respondents. The respondent would complete the online form in the “Favourites” tab, and would be required to complete all compulsory information to successfully submit their responses. The Welsh survey link was available between the 16th of September 2020 to the 31st of January 2021, a period of only 4 months and 15 days. The submission of their online forms took place during the COVID-19 pandemic in Wales. During this time, residents of Wales were still experiencing a lockdown.

Figure 10

Site Structure, Wales Website



4 Results

This section covers findings for Surveys One, Two and Three. Section 4 consists of three parts which are:

Part A: Survey One - Preliminary Study

Part C: Survey Two - Main Study in New Zealand

Part D: Survey Three - Secondary Study in Wales

In Section 4.1, the results for Survey One answers the first research question. Section 4.2 discusses the results from Survey Two, the hypothesis, some random sampling tests, five place correlations and the results of the principal components analysis (PCA) for 16 sense of place values. In Section 4.3, the findings in Wales is discussed. Section 4.4 reviews the dataset and how locations, descriptions and activities are related to favourite places. Also, three remaining research questions will be answered in Section 4.5.

Finally, these findings includes a review of participant information such as their ages, gender, citizen or resident status in New Zealand and Wales, views on user interface design questions, and their personal comments about their favourite places in New Zealand or Wales. As mentioned in the preface, the responses for Surveys Two and Three were collected during various levels of COVID-19 restrictions, including a lock-down period in both countries.

4.1 Part A : Survey One - Preliminary Study

A total of ten participants agreed to participating in Survey One. Regrettably, one participant was disqualified for skipping too many questions³, thus leaving the total number of participants to nine people.

³ Participant 6 skipped 65% of all 40 questions in Option C. Refer to Appendix K for Participant Information.

4.1.1 Participant Information

The demographics for the ten respondents are shown in Table 8. There were three males and six females who participated in Survey One.

Table 8

Participant Information for Survey One

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Option	A	A	B	B	B	C	C	D	D	D
Age	50-59	70+	30-39	70+	50-59	60-69	60-69	50-59	50-59	20-29
Gender	F	F	F	F	F	F	F	M	M	M
Postal Code	3015	-	632	4610	2023	1021	1015	4610	3015	820
Interfaces Reviewed	B, C, D, E, F, G	B, C, D, E, F, G	K, A, L, H, I, J	K, A, L, H, I, J	K, A, L, H, I, J	F, E, K, B, H, A	F, E, K, B, H, A	G, D, L, C, I, A	G, D, L, C, I, A	G, D, L, C, I, A
Correct	17	23	25	35	17	5	26	23	23	12
Incorrect	8	3	8	5	5	3	5	5	9	0
Skipped	2	1	7	0	18	26	3	7	3	23
Total Socio-Economic	3	3	3	3	3	3	3	3	3	3
Total Evaluation	3	3	3	3	3	3	3	3	3	3
Total Questions	33	33	46	46	46	40	40	41	41	41
Total Scores	67%	85%	67%	78%	72%	22.5%	65%	71%	77%	47%
Error %	33%	15%	33%	22%	28%	77.5%	35%	29%	23%	53%

4.1.2 Survey One Findings

In this section, findings were analysed based on several approaches. Firstly, findings based on a comparative analysis for individual interfaces. Secondly, an analysis on ten design factors implemented into the experimental interfaces, and thirdly, a summary of the results across all of the options.

4.1.2.1 Analysis 1: Comparative Analysis Findings

This is a comparative analysis of six interfaces in which the participants of Survey One were required to evaluate interfaces based on two opposites, two alternatives, and two similarities. The findings presented are from four separate options: Option A, Option B, Option C and Option D. In the following paragraphs, some questions and answers from Survey One will be explained.

4.1.2.1.1 Option A

In Table 9, two participants reviewed six interfaces by comparing Interface B with Interface C (see Appendix X). Interface B is the opposite to Interface A, in that B has colour and C has dark colours. Participants reviewed Interface C, an interface with a dark background with grey black text that contrasted against white boxes. The chosen design variables was to test readability and whether the dark font would be legible enough for people to read (Allan et al., 2016). According to the World Wide Web Consortium (W3C), some prefer a contrast of a white background on black text, or a black background on white text. Or even, a medium contrast like grey text on a black background (Allan et al., 2016). Also, the survey results for three selected questions (see Table 9) showed the participants preference for colours.

Table 9

Option A: Interface B versus Interface C

Question	Responses
Q20 - Do you think red buttons or black buttons are stimulating?	100% Red Buttons
Q21 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?	100% Blue Font
Q22 - For a comparison, would you feel more motivated contributing data on the Interface B website more than the Interface C website?	100% Interface B

4.1.2.1.2 Option B

The next six interfaces were assigned to three participants. Option B began with a comparison of Interfaces K and L, and a comparison of similarities (see Appendix X). Both interfaces have a selection of three maps each. All six maps have map design features different to the other map, while some map design features can be found in other maps across Interfaces L and K.

4.1.2.1.2.1 Interface L and K

This is a comparison of similarities between two interfaces (see Table 10) that offered three maps each, and differed to the other, or had similar features like the other. However, they are also alternatives. For example, Interface L offered a slideshow gallery map that showed photos of locations on the map unlike the interactive map in Interface K that offered a search function and a hover function.

Table 10

Option B: Interface L

Option B	Interface L Key Content Version	
Q11	Count icons in the pop-up map	34% responded “Other – 1” 33% responded “9” 33% responded “Other – 14”
Q25	Colour and map icons motivate	34% said “Yes” 33% said “Maybe” 33% said “Not sure”
Q22	Count clusters in the cluster map	100% answered correctly
Q23	Count red circles in the heat map	100% answered correctly

4.1.2.1.3 Option C

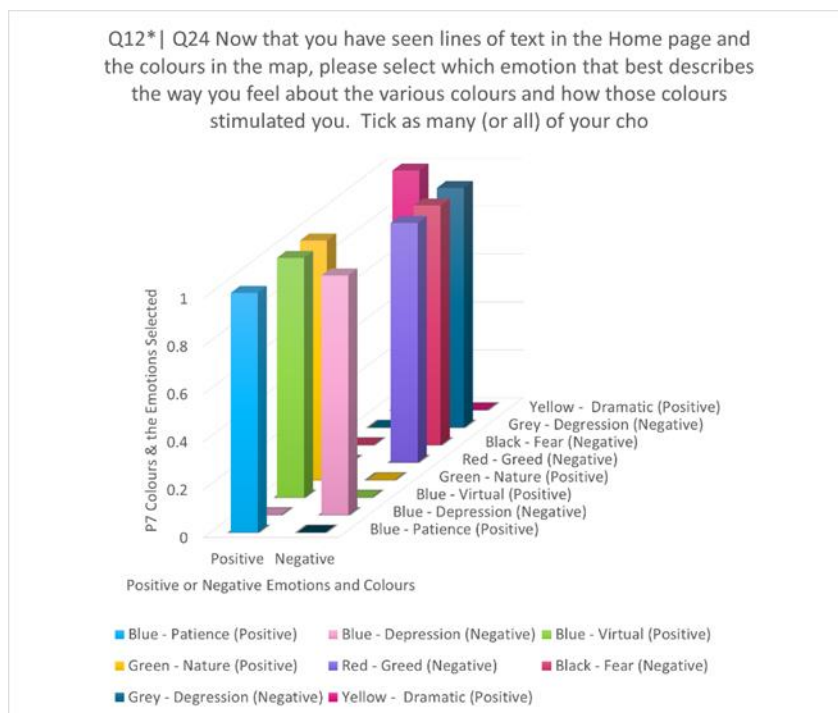
The survey questions for Option C was completed by only one participant, though some of the interfaces the participant reviewed were the same interfaces participants from Options A or D. A brief review of the results of Interface K compared to Interface B will now be discussed.

4.1.2.1.3.1 Interface K compared to Interface B.

In this comparison, two alternatives were compared to find out which interface the participant would find enjoyable. Interface K was an interface that showed three maps and Interface B was a colourful interface. In question 24, the participant reviewed Interface B and had to choose a colour and an emotion that best described how they felt about that chosen colour. The participant then assigned a description of whether their chosen colour created a negative or positive emotion. For example, participant 7 had chosen the colour blue, and the emotions associated to blue. In Figure 11, the participant described the blue colour as a positive emotion that is patient. At the same time, the participant described the blue colour as a negative emotion for one who is depressed.

Figure 11

Colours and Emotions, Interface B



4.1.2.1.4 Option D

In Option D, questions were randomized and can be seen in Appendix AA, which shows the randomized question number first, followed by the logical question number of the original survey. Two participants, participant 8 and participant 9 were assigned to answer randomized survey questions in Option D. Participant 9 however answered questions that were not randomized in Option D. The responses to question 16 by participants in Option D can be seen in Table 11.

Table 11

Interface L versus Interface C

Survey Two		
Option D	Interface L Map Content Version	
Q16	Prefer a pop-up icon with a photo on a map.	67% responded “Yes” 33% responded “9”

4.1.2.2 Analysis 2: Ten Design Factors

Ten design factors were applied to twelve experimental interfaces to help answer the first research question. For each design factor, a claim was made and the evidence of whether these claims were true can be seen in Table 12 (see Appendix W for a reviewal of all ten design factors).

Table 12

Claim and Evidence for Ten Design Factors

How design aspects help?	Claim	Design Variable	Evidence of Claim
Task descriptions tells users what they need to do.	Clearly defined task descriptions needs to be visible, preferably in the home page, and they need to know what is expected of them.	Task Descriptions	Participants P2 and P7 found that task descriptions would help them.
People have preferences for certain colours.	Choosing colours for buttons vary based on users' preferences for colour.	Colour	Participants in Option A preferred red buttons more than black buttons, and blue font more than black font. Participants in Option D preferred black buttons more than red.
Designing online forms with radio buttons, check boxes and buttons can make the user experience more enjoyable.	Interactive forms can be enjoyable when form features are varied. User experience is enhanced when colour is added to the design of the web application which	Interactivity, Form Features	Participants in Option A found the use of buttons made the user experience more enjoyable. Also, participants in Options A and D selected a range of form features they preferred, ranging from radio buttons, check boxes,

	could include the online form.		text fields, text area box, uploading a photo, and the "Submit" buttons to all of the above.
An application that is simple to use is good.	An interface is better when the design is simple and the layout is less clustered. This is a challenge but the responses show this was preferred by participants in Option B.	Simple to use	<p>Participants were asked to review Interface A, the standard interface and “click on every page and select which feature they liked the most”.</p> <p>Participants in Option B said, what they liked the most:</p> <p>67% simple to use 33% clean layout</p> <p>Option C answered: 100% simple to use.</p>
Interesting map design features such as icons, pop-up text boxes or pop-up photos would be preferred.	An interactive map is preferred more than a static map. Maps that displays icons, pop-up boxes and photos offer better user engagement	User Engagement, Map Design	Interesting map features such as icons, pop-up text boxes can provide good visualization and imagery in maps. For example, participants in Option B, 67% responded “Yes”, and

	with interesting visual map design features.		33% responded “Maybe” to the question that they would prefer a map that displayed icons, pop-up text boxes or pop-up photos of the location, more than the standard static map.
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4.1.2.3 Analysis 3: Across All Options Findings

The findings of Survey One were many. In Table 13, a brief summary of twelve survey questions across all of the options is listed. The findings below show that users prefer colour, and the brighter the colour, the more preferred. Colours such as red more than black, blue more than black, a colourful interface more than a non-colourful interface. The text colours also showed one participant could read blue text while another participant could not, highlighting that the colour of text chosen for web design would affect their ability to read web content, thus affecting the user experience. Also, the colours chosen for a website could affect people’s preference for an interface.

Table 13

Summary Across All Options

	Option A	Option B	Option C	Option D	Overall Results	Interface
<i>Participants</i>	2	3	1	3		B
Red Buttons	100%		100%	25%	67%	

Black Buttons				75%	33%	
<i>Participants</i>	2		1	3		C
Blue Font	100%		100%	34%	66%	
Black Font				33%	17%	
Other				33%	17%	
<i>Participants</i>	2		1	3		B, C
Prefer Interface B	100%		100%		50%	
Prefer Interface C						
Both				34%	17%	
Other				33%	16%	
Neither				33%	17%	
Colours hard to read						B
<i>Participants</i>	2		1			
Blue	25%				25%	
Red	75%				50%	
Yellow			100%		25%	
Colours easy to read						B
<i>Participants</i>	2		1			
Blue	34%		50%		40%	
Grey	33%				20%	
Yellow	33%		50%		40%	

4.1.3 Key Findings

The key findings relate to colour, map design, and design features. They are as follows:

- 100% in Option A agree that buttons make the user experience more enjoyable.

- 67% in Option B would prefer a map with icons and interactive pop-up boxes more than a static map.
- 67% prefer red buttons more than black buttons.
- 66% prefer blue font more than black font.
- 100% in Option B would be motivated to contribute data if they received rewards.
- 100% in Option C felt that task descriptions help perform certain tasks.
- 75% in Option D responded they would remember a location on a map if there was a pop-up icon rather than a blue map marker.

The responses show peoples preferences of colour and map design, including their reasons for motivation.

4.1.4 Key Findings in VGI Responses

- Quality of responses for VGI map questions in Survey One showed only 18% answered seven VGI questions correctly, while 83% answered incorrectly.
- 100% incorrectly answered three VGI questions from two groups, Option B and Option D (Questions 9, 10, 12).
- 75% incorrectly answered one VGI question (Question 11), while 25% answered correctly from Option B.
- 100% incorrectly answered one VGI question (Question 11) from Option D.
- 100% correctly answered one VGI question (Question 22) from Option B.

The results show the number of incorrect answers when using a map. This reveals people's abilities in using online digital maps.

4.1.5 Accuracy and Quality of Data

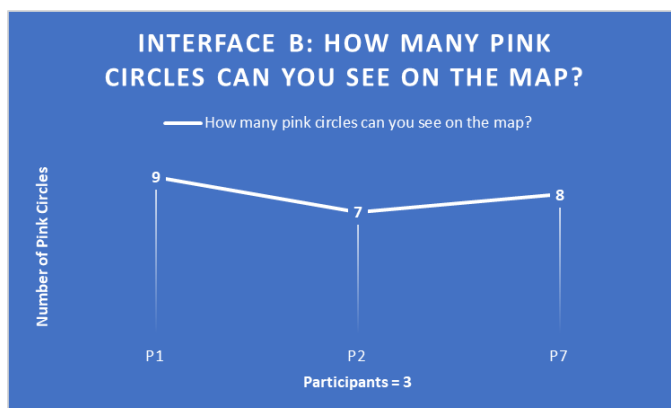
Participants were asked to correctly identify the total number of pink circles on a map (see Figure 12). The correct answer showed ten pink circles. However, all three participants

answered incorrectly. This raises questions of how could participants miscount a total of ten pink circles on a map? How does this affect the quality of data in crowdsourcing projects? Perhaps the participants might have rushed through the questions, overlooked some circles, did not pan around the map, or perhaps counted with a pen and paper and wrote the wrong number.

A normal distribution was conducted to review the number of pink circles each participant had counted. This was to see whether the distribution of data would show a bell curve given that all three answers were wrong. Also, the normal distribution model, though only three people, can reveal how good or bad the distribution of data could look like with a larger group of people who would be asked to count objects on a map for VGI crowdsourcing projects.

Figure 12

Pink Circles, Interface B



In Table 14, the mean, average and median of their answers is listed. The mean number for pink circles is 8.

Table 14

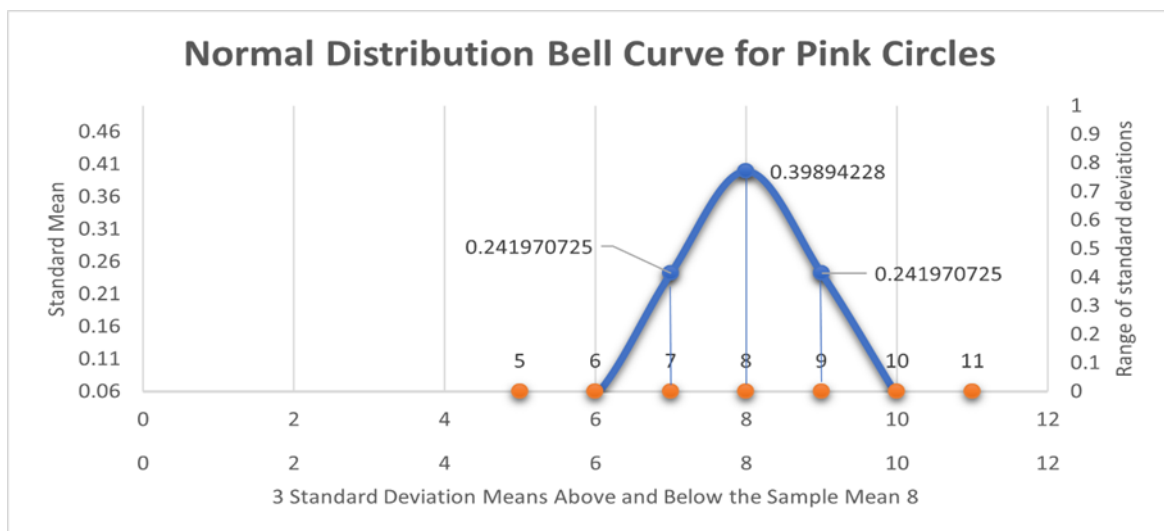
Statistics for Pink Circles

Minimum	Maximum	Mean	Std Dev	Median
7	9	8	1	7

The standard deviation in Table 14 is 1. The normal distribution for all three participants can be seen in Figure 13.

Figure 13

Normal Distribution for Pink Circles, Interface B



The normal distribution for the counting of pink circles in Figure 13, though showing wrong answers for three participants, shows a normal bell curve for three standard deviation means above and below the sample mean of 8. While this small sample size did not affect the skewing of either or both tails, the counting of pink circles still showed inaccuracy of data, thus affecting data quality. This raises questions of whether counting objects incorrectly on a map might perhaps be a common issue in large VGI crowdsourcing projects, affecting data quality.

4.1.6 Identifying Objects on a Map

There were other VGI questions in Survey One that required participants to identify and count objects across several maps. In Table 15, the exact question and the participants responses are listed below. As you can see, the participants answered incorrectly for questions 9, 10, 11, 12, 14, and 28 with the exception of participant 4 answering question 11 correctly, and participant 5 answering question 14 correctly. For questions 22 and 23, only 3 out of 4 answered correctly.

Table 15

VGI Questions in Survey One

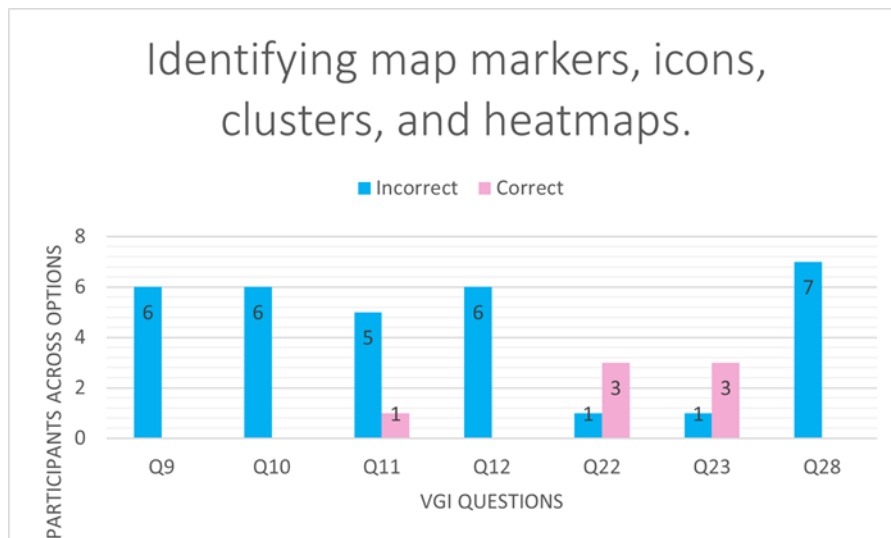
Map Questions	Answers	P3	P4	P5	P7	P8	P9	P10
Q9 - How many purple map markers can you see in the pop-up map?	17	Other: 7	Other: 5	Other: 8	N/A	Other: 5 by zooming out a bit	4	Other
Q10 - How many red map markers can you see in the pop-up map?	10	Other: 2	Other: 2	Other: 3	N/A	Other – 2	Other: 2	5
Q11 - How many pop-up icons can you see in the pop-up map? Hint: zoom out and look out for little grey icons.	9	Other: 1	9	Other: 14	N/A	Other – 4	Other - none that works as popups	11
Q12 - How many pop-up markers did you see in the slideshow gallery map?	16	Other: 14	Other: 14 by zooming in	Other – 14	N/A	Other – 14	Other – 4 that work	12
Q22 - In the cluster map, how many clusters can you see?	3	3	3	3	2	N/A	N/A	N/A

Q23 - How many red circles can you see in the heat map?	3	2	3	3	3	N/A	N/A	N/A
Q28 - We will start off by looking at a standard map. How many blue markers can you see on the map?	20	Skipped	Other: 7	Other: 7	7	7	Skipped	Skipped

Figure 14 shows the number of correct and incorrect responses to seven VGI questions when identifying objects in maps, such as icons, map markers, clusters and circles in heat maps. Their answers reveals what makes a good map design and what help are given to users. Firstly, map markers, icons, and symbols needs to be clearly identified and large enough for users to see. Secondly, users may find it easier to search for one object in a map, in one location, rather than throughout the map. For example, participants had to find objects that were less than 10, such as the cluster map that only had three clusters in question 22, and the participants answered those questions correctly. Thirdly, the quality of responses were not very accurate which means that VGI crowdsourcing projects might be more successful if users were asked to find one or a few objects on a map.

Figure 14

VGI & Map Questions



4.1.7 System Usability System (SUS) Evaluations

The SUS Likert scale used in Survey One was a 7-point Likert scale that allowed for more choice selection by the participant. The benefits of using 7 points over 5 points is that there is less interpolation with 7 points, which is often a common problem in 5-point scales, especially since studies show that users show some difficulty in choosing between 2 points on a 5-point scale (Sauro, 2010).

After the participants completed the SUS sheets, the scores from 7 points to 5 points was converted in order to score the SUS evaluation forms. Table 16 shows how the conversion was made from 7-points to 5 points (Gunawardhana, 2017).

Table 16

Converting SUS Scores

7-points Likert Scale	7-points Likert Scale	5-points Likert Scale	5-points Likert Scale
1	Strongly Disagree	1	Strongly Disagree
2	Disagree	1	Strongly Disagree
3	Somewhat Disagree	2	Disagree
4	Neither Agree nor Disagree	3	Neutral
5	Somewhat Agree	4	Agree
6	Agree	4	Agree
7	Strongly Agree	5	Strongly Agree

4.1.8 SUS Scores for Survey One

The SUS scores for Survey One were high only for a few interfaces and low for other interfaces (see Table 17). Some points of note are as follows:

- P3 evaluated all 6 interfaces using the “Neither agree nor disagree” or “Neutral” rating, giving a SUS score of 50 (SUS-Grade E) for all interfaces reviewed.
- P1 scored Interface B with an A- SUS grade.
- P1 scored Interface C with an A- SUS grade.
- P4 scored Interface H with a C+ SUS grade.
- Scores between 51.7 to 62.6 with a D SUS grade:
 - Interface A : P4
 - Interface D : P8
 - Interface L : P8 and P10
 - Interface C : P10
- Scores under 51.7 included interfaces:

Interfaces A, B, C, D, E, F, G, H, I, J, K, and L.

- Interfaces that scored from 51.7 and above were:

Interfaces B, C, H, A, D, and L.

- P5 did not get an activation link from Gametize and was unable to answer 23 questions for Interfaces H, I, and J.

The SUS scores were surprisingly low. Participant 1 liked interfaces B and C. However, participant 3 scored all 6 interfaces with the point number 4, giving a score of 50 for each interface she reviewed.

Table 17

SUS Scores, Survey One

Interface	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
A			50	57.5	35.0	Skipped	30	47.5	Skipped	Skipped
B	80	50				Skipped	32.5			
C	80	40						25.0	25.0	52.50
D	37.5	42.5						52.5	15.0	50.00
E	37.5	37.5				Skipped	30.0			
F	Skipped	Skipped				Skipped	37.5			
G	Skipped	Skipped						35.0	10.0	Skipped
H			50.0	72.5	37.5	Skipped	35.0			
I			50.0	50.0	Skipped			50.0	Skipped	Skipped
J			50.0	50.0	Skipped					
K			50.0	35.0	32.5	47.5	42.5			
L			50.0	7.5	32.50			55.0	40.0	57.5

4.1.9 Answering Research Question 1

The findings of Survey One were many and useful. Of most importance, the findings answered the first research question:

1. *What design aspects in user interface design would produce a web application that is user-friendly?*

Design aspects such as a colourful interface, colourful buttons, radio buttons, check boxes and buttons are features that people preferred and would make for a user-friendly web application. The key findings in Section 4.1.3 showed that users preferred colour, form features and good VGI map design. For example, 67% of people preferred red buttons more than black buttons, and 66% preferred blue font more than black font. People are more motivated contributing data when the interface is colourful, rather than an interface that uses black and white colours or dark colours.

Also, the colour blue was harder to read for participant 1, but was a colour that participant 2 found easier to read. The results for Interfaces B and C showed that people perceived a colourful application is better than a non-colourful interface. Form features such as radio buttons, check boxes and buttons can make the user experience more enjoyable as demonstrated in Survey One. Finally, Interface K and Interface L displayed a total of six maps (three maps per interface) for participants to utilize, perform task descriptions and answer survey questions.

The key findings in 4.1.4 showed that the quality of responses for VGI data in Survey One revealed that only 18% answered correctly to seven VGI questions, while 83% answered incorrectly. These incorrect answers were mainly due to miscounting objects on a map, such as the miscounting of pink and blue circles. Participants responses for seven map questions showed that the quality of data submitted was largely inaccurate. The uncertainty of why were objects miscounted incorrectly would need to be explained more fully in a future experiment.

However, possible answers might be due to incorrect digital map handling which often requires panning, zooming and mouse or hover movements. Also, the results showed that answering map questions often required time and effort which affected the accuracy of data submitted by participants. However, users could identify the number of circles on the cluster map because there were only three circles, which was easier to locate than having to find and count ten pink circles.

There is still room for improvement by participants in providing good quality data involving VGI projects, especially since counting objects on a map can be difficult for those whose vision or orientation of a map is confusing or complex. Therefore an interactive map would not necessarily generate good quality and great quantity of data submitted by users if the task description is difficult. Rather, more exploration needs to be made towards finding ways of making maps even simpler. Testing users' orientation of maps would be a recommended future suggestion, as well as measuring task complexity to understand further how to improve quality data and increase the quantity of data.

4.2 Part C: Survey Two - Main Study in New Zealand

There were 114 respondents who participated in Survey Two. Their responses were measured as individuals and as a group. Their answers included a rating of 16 personal or place statements, measuring their preference for values between 1 to 7, 1 as "Entirely Disagree", 2 as "Mostly Disagree", 3 as "Somewhat Disagree", 4 as "Neither agree nor disagree", 5 as "Somewhat agree", 6 as "Agree" and 7 as "Entirely Agree". The dataset included both a mix of quantitative and qualitative variables to compare how some aspects of sense of place are correlated with other aspects, such as place identity or place attachment. Finally, the results of 114 respondents for Survey Two were analysed into the following categories:

1. Analysing the responses for questions 4 to 19 on the Favourite Form, who rated 16 values on a 7-point Likert scale.

2. Analysing the responses for questions 1 to 3 on the Favourite Form, the latitudinal and longitudinal coordinates of favourite places, users' comments about their favourite place, and their reasons why it is their favourite place.
3. Analysing the responses for questions 20 to 22 on the Favourite Form, and conducting random samplings of age, gender and resident status in New Zealand.
4. Analysing the locations, activities and descriptions of favourite places.

Three analyses included using the following statistical mathematical functions of:

- Correlation Pearson
- Principal Components Analysis (Correlation Pearson)
- T-Distribution Model

These are statistical methods to identify correlations between respondents and values. The fourth analysis used was a concordance, and the ArcGIS (Aeronautical Reconnaissance Coverage Geographic Information System) software to map some locations to activities and find nearest distances of activities of favourite places to find out what people do at their favourite place.

4.2.1 Tools

The tools used to calculate the quantitative and qualitative data for the results of Surveys Two and Three were:

- Microsoft Excel 2016
- Microsoft XLSTAT 2016
- AntConc
- ArcGIS online software

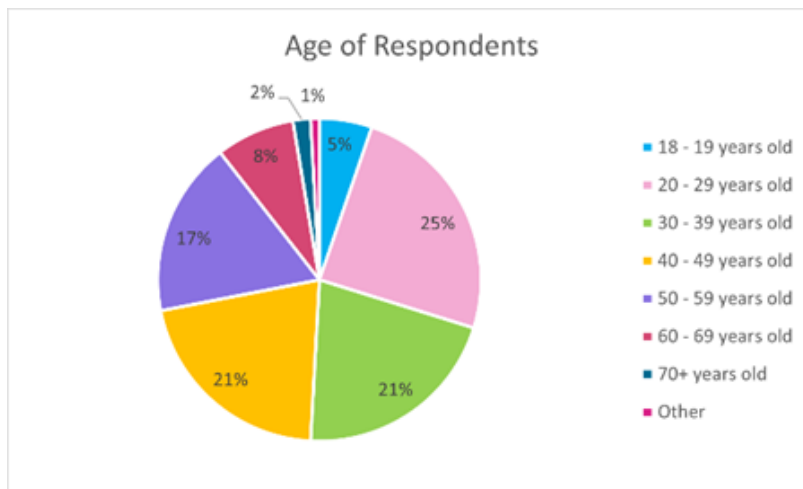
By using Microsoft Excel 2016 and Microsoft XLSTAT 2016, a principal component analysis was performed for 16 sense of place values to find clusters for values preferred more than others, a Pearson's correlations matrix to find any patterns of similarity and behaviour between place values, and a T-distribution model to hypothesize the average Likert mean score across 16 values for 114 respondents. Also, AntConc, a concordance was used to find the frequency of keywords in the "My Favourite Place" corpus. Lastly, ArcGIS online was used to search for any clusters within the locations provided in the dataset.

4.2.2 Demographics of Respondents

There was a good distribution of ages and genders in the New Zealand dataset. Most of the respondents were citizens or residents of New Zealand, numbering 104 people, while 10 were non-citizens of New Zealand. There were 60 males and 54 females. There was also a good spread of favourite places in New Zealand indicating that the people who responded to the survey came from all throughout the country. In Figure 15, there were three age categories of respondents aged between 20 to 49 years of age. The pie chart shows 25% of the respondents were between the ages of 20 to 29, 21% between the ages of 30 to 39 year olds, and 21% between the ages of 40 to 49 year olds.

Figure 15

Ages for 114 Respondents



To source respondents, inviting messages were posted nationwide to users on Reddit, Facebook, Twitter, Tumblr, Pinterest, Flickr, LinkedIn and Instagram to participate in this study. The social media postings included QR codes and images created to generate interest from the public (see Appendix T). The postings received good responses showing the collected data to be unbiased and well dispersed throughout New Zealand.

4.2.3 The Average Likert Mean Score

The dataset was analysed in two ways; across 114 individuals and across 16 groups of place values. Firstly, to find the average Likert mean for individuals, the scores for each individual were added and their final scores were averaged. Then, the averages for all 114 respondents were added, and averaged to find the average Likert mean score for the entire data set. Secondly, to find the average Likert mean score for the groups, all the scores for 16 place values (the scores answered by 114 respondents) were added, and then averaged for each group to find the average Likert mean score per place value.

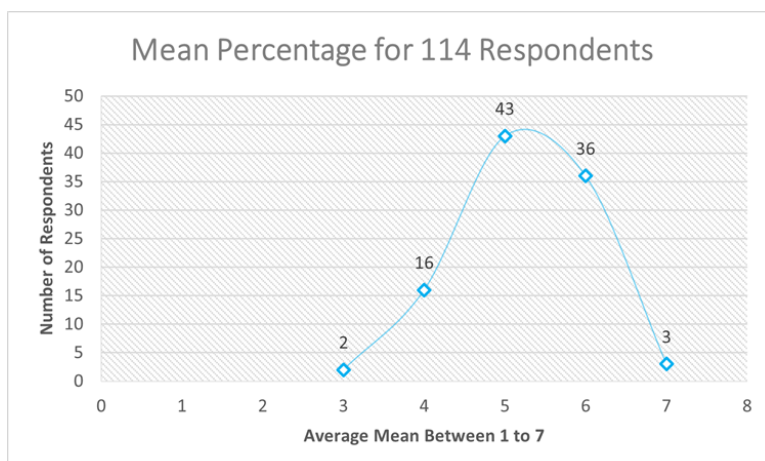
These 16 place values were labelled as the following variables: memorable, spiritual, attractive, identity, genealogy, relationships, attached, identify, wildlife, dependence, recreational, ecological, cognitive, wilderness, economic, and intrinsic. These variables are linked to place attachment, place identity, or place dependence place values.

The measurements of the 7-point Likert scale helped answer key sense of place research questions such as, why do people value certain sense of place values more than others, and which values they preferred the most or the least by looking at the average Likert mean score for each value. For example, in Figure 16, the average mean for 114 respondents shows the average Likert mean score for each individual, who rated 16 place statements on a 7-point Likert scale.

The percentage of people whose average Likert mean fell within the 5, 6 and 7 point ranges totalled 82%, showing that only 2% averaged “Somewhat Disagree” and 16% were “Neither Agree nor Disagree”. This reveals that people overall agreed with most of the 16 values and that the average Likert mean score per individual would be between the Likert scale point numbers of 5 to 7.

Figure 16

Average Mean for 114 Respondents

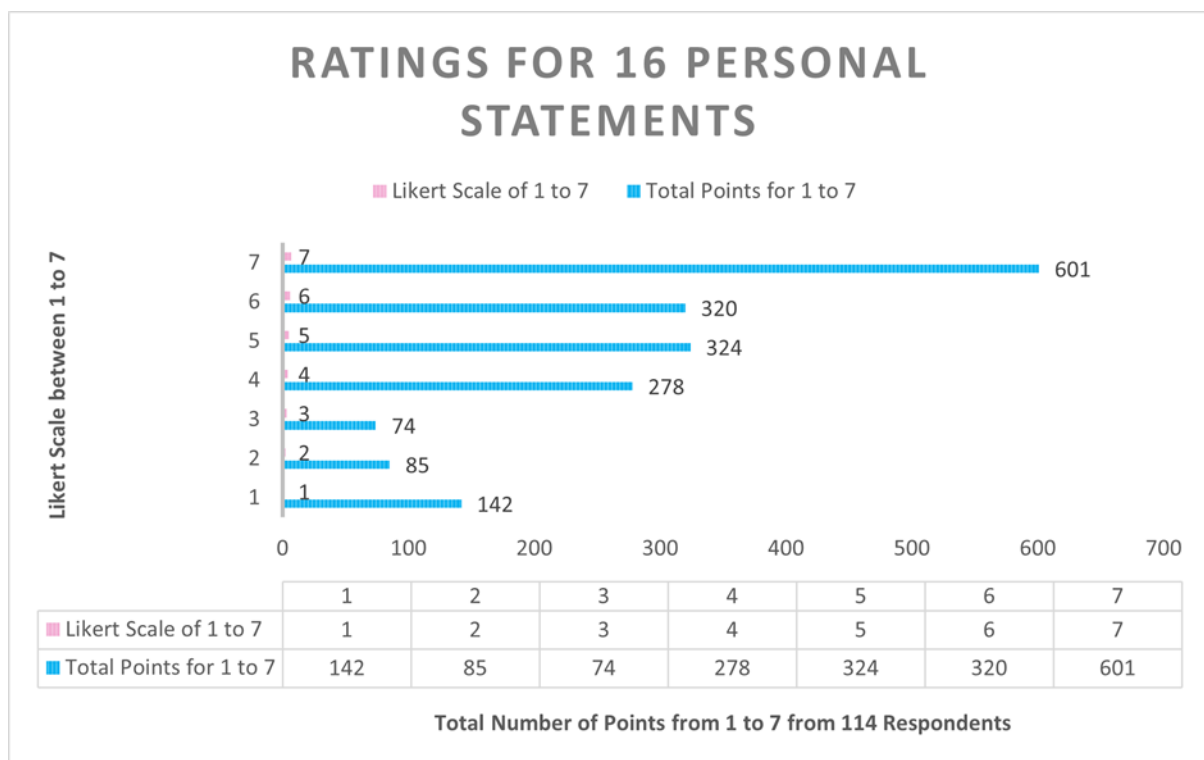


The focus on the average Likert mean score helps answer why people value certain places more than others. For instance, a high average mean score informs which place values they preferred the most. This preference is also seen in a ranking of 16 values from the highest average Likert mean score to the lowest Likert mean score.

In Figure 17 however, only 68% ticked between 5 to 7 and 32% ticked 1 to 4. This shows that although 82% was above the average Likert mean score of 5 points, the individual was rating some values high and others low and averaging out their own individual average mean score to either 5 and above or below 5.

Figure 17

Bar Graph of Points for the Likert Scale



As Figure 17 shows:

- 68% of respondents ticked the point numbers 5 to 7, 1245 times out of 1824.
- 33% of respondents ticked the point number 7, 601 times.

- Point number 7 was the most popular out of all of the points between 1 to 7.
- Only 17% of respondents ticked the point numbers 1 to 3.
- Only 15% of respondents ticked the point number 4, “Neither Agree nor Disagree”.

The percentages of people who ticked whole point numbers of 1 to 7 above showed that people ticked high points for values they agreed with, and low points for values they disagreed with. This reveals which values were more important than others, and peoples overall positive feelings about place values. It helps key stakeholders and policymakers identify peoples need for places that offers safety, clear air, water, wildlife, marine life, and beautiful landscapes.

Since the average mean was an important starting point for the analysis, the following findings are:

- The average mean for 114 respondents was 5.150 (5 rounded).
- 82% or 93 out of 114 respondents scored an average Likert mean between 5 to 7 points.
- 16% or 18 out of 114 respondents scored an average Likert mean of 4 points.
- 2% or 3 out of 114 respondents scored an average Likert mean of 3 points.
- The lowest average Likert mean was 3.25 (3 rounded) for respondent 59.
- The highest average Likert mean was 7 for respondent 85.

The distribution of the New Zealand data set shows peoples responses as normal and reflect the general population.

4.2.4 Points of the Likert Scale

The respondents assigned a point between 1 to 7 describing their views on 16 place statements (see Table 18). The 7-point Likert scale was used to measure which value was more important, and which values were similar to other respondents who assigned a similar point to a certain value.

Table 18*Distribution of Likert Points for 114 Participants*

Likert Scale Point Range	Total Sum	Scale of Agreement or Disagreement Percentage
7	601	33
6	320	17
5	324	18
4	278	15
3	74	4
2	85	5
1	142	8
Total Number	1824	100

4.2.5 Using the T-Distribution Model for Hypothesis Testing

The T-Distribution model, which is a type of a normal distribution, was used to conduct a hypothesis test to make the claim that the probability of people who will rate a favourite place across 16 place values, would average a Likert mean score of 5 points on a 7-point Likert scale. Finally, Excel was used to calculate a probability density function of the T-distribution model. The mathematical formula for the T-distribution is:

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}}$$

To conduct a t-test in Excel the following command is:

T.DIST(x, deg_freedom, cumulative)

The x used in this formula was the z-test statistic of 2.02029, with 31 degrees of freedom and a cumulative statement of “False” (see Figure 18). The average Likert mean score for each place value was calculated, totalling sixteen place values, which was 5.150. To inspect the shape of the tails ensuring that a bell-shaped curve would appear, 9 standard deviations of 3 above and 3 below was applied. The standard deviation used was 0.791 and the sample mean used was 5.15. The last argument for the T-distribution command used in Excel required a logical value as the distribution. In the T-distribution formula, the argument used was “FALSE”, indicating that the type of distribution calculated would be a normal probability density function.

4.2.6 Hypothesis Testing

Hypothesis testing helps answer whether a claim might be true. For example, hypothesis testing can be used to find out peoples’ views on favourite places based on the average Likert mean score. Each place statement is associated with a sense of place value. On a 7-point Likert scale, the point numbers 5 to 7 are numbers in positive agreement of a place statement. A point number between 1 to 4 is considered negative with disagreements compared to positive agreements between 5 to 7.

The purpose of a hypothesis testing is to find merit in a claim by creating a null hypothesis. If there is no merit in the claim then the hypothesis would be rejected and an alternative hypothesis would be made. Two hypotheses were formed based on several questions: What would the likely average Likert mean score be for each person that completes the online survey? How do they feel about sense of place values? And why do they like their favourite place?

In this study, two claims is made. Firstly, the hypothesis claims that the average Likert mean score from 114 respondents would likely be placed within the range of 5 points or greater on the Likert scale, because people generally feel positively about their favourite place. However, some people would rate the 16 place statements negatively and would disagree to some of statements. As a result, this study claims, that given a set of 16 randomized personal statements, people would consider some place values as more important over others, some place values as less important than others, while others would consider some values as least important compared to all the other place values.

This study asserts that people will not respond positively to all 16 statements and that some scores will be in the negative area of the measurement scale of 1 to 4. Finally, the total scores from the Likert scale for each respondent will be added, and then the mean score will be averaged for each respondent, totalling 114 people. The total scores for each value will be added and averaged, and then averaged as a group to get the total mean scores for all 16 values. The hypothesis is as follows:

H₀ : The hypothesis null states that the average Likert score or mean score of this sample size of 114 respondents, would be equal to or greater than 5 points when people rate all 16 personal statements on the online survey.

H₁ : The alternative hypothesis states that the 7-point Likert average mean of this sample size of 114 respondents would be less than or equal to 4 points.

The equation shows the mean would be equal to or greater than 5 points or less than or equal to 4 points.

$H_0 : \mu \geq$ equal to or greater than 5 points

$H_1 : \mu \leq$ less than or equal to 4 points

To test the null hypothesis, the significance level or alpha was set at 5%, with a 95% confidence. The level of confidence is calculated as:

Alpha = 0.05

Confidence = $1 - 0.05$

= $1 - 0.05$

= 0.95

Level of confidence = 95%

The number of observations was set at 114. The sample mean was 5.15 and the population mean was 5. The standard deviation for the population was 0.791 (see Figure 18). A two-tailed t-test was conducted for the entire 114 data set, giving a p-value of 0.051582. Since the significance level was set at 5%, it would be important for the p-value to be less than 0.05. This is because if the p-value is equal to or less than 0.05 then the hypothesis strongly works against the null hypothesis in which case we will go for the alternative hypothesis. If the p-value is greater than 0.05 then the null hypothesis has merit. Upon running a t-test on the data, the p-value was 0.51582 and is greater than 5% indicating that the null hypothesis has merit.

This means that the average Likert score analysed for Survey Two, would most likely have an average mean score, or average Likert mean score of 5 points and greater for all samples. This is significant because the average Likert mean score reveals whether people feel positively about their favourite place.

The average Likert mean score of 5 points and above for the entire 114 respondents also demonstrates that people scored some sense of places negatively suggesting that some place values scored high, while others scored low because they were viewed as less important. The sample mean used was the original average Likert mean score with a decimal placement of 6 digits that Excel calculated showing a p-value of 0.051582 in Figure 18.

Figure 18

Calculations for a T-Distribution of 114 Respondents

Sample Mean for 114 Respondents	5.15
Population Mean rounded for 114 respondents	5
Std Dev of population	0.791
Number of observations called n = 114	114
z test statistic	2.02473
p-value	0.051582

In Figure 19, you will note the vertical list of 1 to 10 which is the output of a t-test performed using Excel. The sample mean of 5.15 and the standard deviation of 0.791 can be seen as well as 6 x -Values for 3 standard deviations above and below the sample mean.

Figure 19

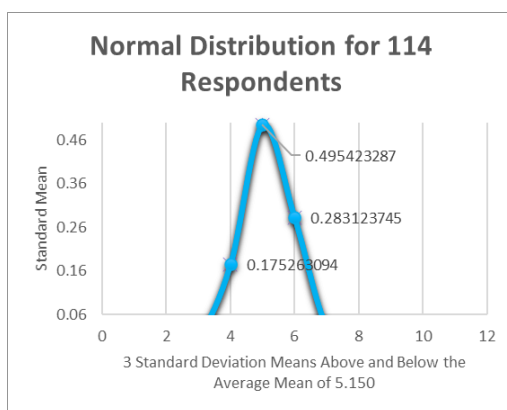
Excel Calculations for a T-Normal Distribution of 114 Respondents

			Mean	5.15	
1	5.29805E-07	0	Std Dev	0.791	
2	0.000181243	0			
3	0.012534831	0			
4	0.175263094	0			
5	0.495423287	0	Std Dev	X-Value	Y-Value
6	0.283123745	0	3 Std Dev Below	2.777293	0
7	0.03271072	0	2 Std Dev Below	3.568195	0
8	0.000764043	0	1 Std Dev Below	4.359098	0
9	3.60794E-06	0	Mean	5.15	0
10	3.44441E-09	0	1 Std Dev Above	5.940902	0
			2 Std Dev Above	6.731805	0
			3 Std Dev Above	7.522707	0

In Figure 20, the bell-shaped curve shows the average Likert mean score of 5 in the bottom axis for the average Likert mean score for 114 respondents, who rated 16 place values on a 7-point Likert scale.

Figure 20

T-Distribution for 114 Respondents



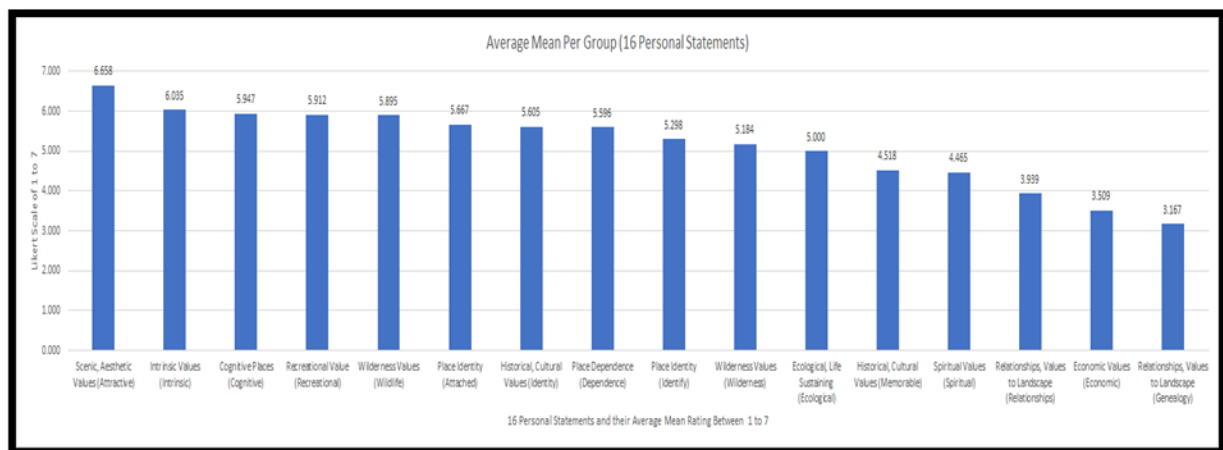
4.2.7 16 Sense of Place Values

There were 16 personal statements, each with a particular sense of place value. The bar graph in Figure 21 shows from the left the highest average Likert mean score for all of the place values starting with the attractive value. At the bottom of the graph, the bar has listed the

variables (identifiable names) and place statements for all 114 respondents with their average Likert mean score. At times, the names of the values and variables were used interchangeably in Section 4 as there were more than one statement for the same value.

Figure 21

Bar Graph of 16 Values for 114 Respondents



The bar graph in Figure 21 shows which place value is most preferred and which is least preferred. It also shows 11 values from the “Scenic, Aesthetic Vales (Attractive)” value to the “Ecological, Life Sustaining (Ecological)”, that are rated above the average mean Likert score of 5. There are only 5 values that were rated below the average Likert mean score of 5 points which were memorable, spiritual, relationships, economic and genealogy.

4.2.8 Visualizing the Data on the Box and Whisker Plot Graph

A Box and Whisker Plot graph visually displays how the dataset was distributed and where the median was placed on the plot graph. The box and whisker plot graph would reveal additional details that the earlier T-distribution did not reveal, such as how the respondents answered all 16 questions as indicated by the position of the whiskers and where the median line is drawn within the box.

To understand this further, let's look at the data in Figure 22. The data is measured on a scale consisting of five numbers which was calculated using Excel 2016. The average Likert mean scores for each place value was added and then averaged the Likert mean score across sixteen values. The minimum average Likert mean score number is 3.1667. The first quartile is 4.5175, the median number is 5.2982, third quartile is 5.8947, and the maximum number is 6.6579 (see Table 19). The range of these numbers is 3.4912.

Table 19

Minimum, Median and Maximum Values for 16 Values

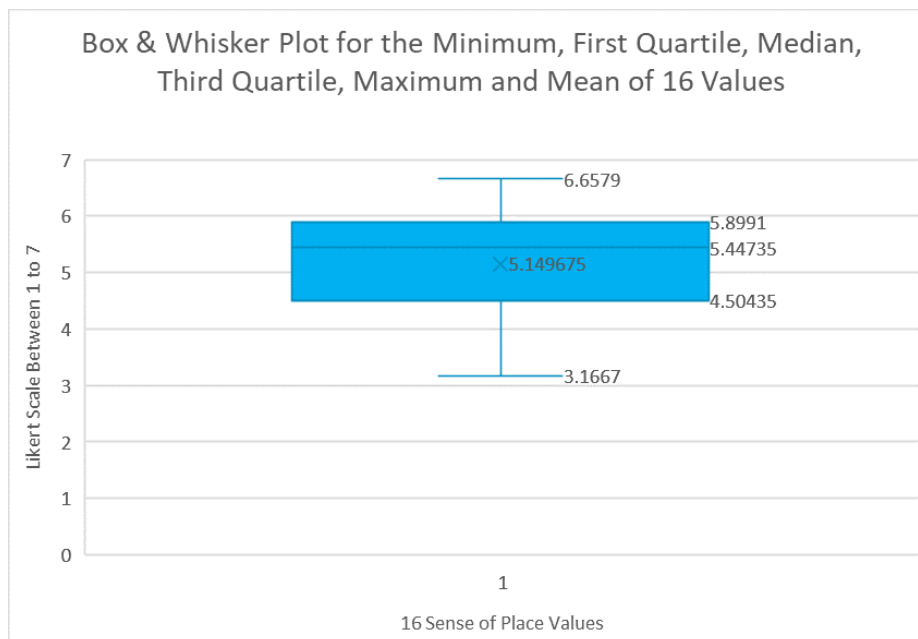
Minimum value	3.1667
First quartile	4.5175
Median value	5.2982
Third quartile	5.8947
Maximum value	6.6579
Mean	5.149676
Range	3.4912

The box and whisker plot graph divided the data into four parts or quartiles consisting of 25% per quartile. Once Excel processes the data, the average Likert mean score for all 16 place values is centred in the middle of the box and the median would be either above or below the average Likert mean score for 114 respondents. As seen in Figure 22, the median of 5.44735 is higher than the average Likert mean of 5.149676 and is positioned above the mean. It is also closer to the third quartile in the top part of the scale at 5.8497. The graph in Figure 22 shows the distribution of the data is negatively skewed because the top whisker is shorter than the bottom whisker, suggesting that the respondents tended to score some sense of place values

quite high and other values quite low. Another indication that the distribution is negatively skewed is that the median is above the average Likert mean score of 5.149676.

Figure 22

Box and Whisker Plot of 16 Values for 114 Respondents



The box and whisker plot graph in Figure 22 showed that there was a high frequency of high and low scores, indicating which place values were more important to the general population, and which place values were least preferred.

4.2.9 Findings

The following findings refer to 16 sense of place values:

- The average Likert mean score for all 16 sense of place values is 5.150.
- Twelve place values had an average Likert mean of 5 and above, while three place values averaged a Likert mean score of 4, and one place value at 3.
- Attractive places ranked the highest value of 6.6579.
- Favourite places are not usually linked to genealogical ties at 3.1667.
- Intrinsic values rated second highest of 6.0351.

- Cognitive value rated third at 5.974.
- Recreational value rated fourth at 5.9123.
- Wildlife value rated fifth at 5.8947.
- Spiritual value had a Likert mean average score of 4.465.
- Relationships or the memorable value had an average Likert mean of 3.939.
- Economic had the second lowest average Likert mean of 3.509.

4.2.10 Correlations Between Place Values

Place values provides reasons why people prefer a place more than others. The results of Survey Two would show correlations that might have appeared between 16 place values, especially since the place statements were being rated on a 7-point Likert scale. We used Pearson's correlation formula which is:

$$r = \frac{n (\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2] [n\Sigma y^2 - (\Sigma y)^2]}}$$

The Pearson's correlation formula in Excel is: Pearson(array1, array2)

Using Excel 2016, a correlation matrix was created to identify any linear patterns that might exist between place values. Linear patterns can be found when comparing two different place values that show similar sized groups who assigned the same number of Likert points on a 7-point scale for different place values.

The importance of identifying these similar linear patterns helps investigate which sense of place value is viewed similarly to people. For example, there were five positive correlations (see fields highlighted in orange in the Correlation Matrix in Figure 23), although

moderate, and 20 negative values. The correlation between place attachment and place identity were moderate showing an R-value of 0.617655, suggesting that place attachment and place identity towards a favourite place is of similar importance to people.

Place dependence and place attachment also showed a moderate correlation of 0.563511 indicating that people felt similarly about place attachment or place dependence towards a favourite place. On the other hand, there was a stronger correlation of 0.634 between the spiritual value and place identity, revealing that favourite places are places people feel spiritually connected to, and feel similarly about their spirituality as like their identity. The five correlations range from an R-value of 0.547 to 0.611412 for the following place values:

- Attached and Identify at 0.617655.
- Attached and Dependence at 0.563511.
- Spiritual and Identify at 0.634.
- Memorable and Relationships at 0.547.
- Wildlife and Ecological at 0.611412.

Figure 23

Correlation Matrix for 16 Values and 114 Respondents

	memorab	spiritual	attractive	identity	genealogy	relationships	attached	identify	wildlife	dependen	recreation	ecological	cognitive	wilderness	economic	intrinsic
memorable	1	0.360496	0.06721	0.280141	0.438582	0.547104	0.209237	0.348885	0.167326	0.214708	0.148227	0.27413	0.210996	-0.05784	0.26312	0.207656
spiritual	0.360496	1	0.006137	0.302662	0.356927	0.486954	0.437147	0.639619	0.008285	0.424743	-0.15891	0.081912	0.232159	0.200861	0.056325	0.108308
attractiveness	0.06721	0.006137	1	0.061312	0.064291	0.110925	0.142523	0.2123	0.376436	0.188726	0.438848	0.346059	0.166541	0.335801	-0.02112	0.187731
identity	0.280141	0.302662	0.061312	1	0.190276	0.326475	0.281009	0.243746	0.165703	0.329634	0.128753	0.326307	0.241085	0.20598	0.112006	0.183495
genealogy	0.438582	0.356927	0.064291	0.190276	1	0.445224	0.312061	0.475928	-0.02649	0.210302	0.034702	0.114398	0.243929	0.012063	0.119051	0.100892
relationships	0.547104	0.486954	0.110925	0.326475	0.445224	1	0.332984	0.466419	0.118822	0.253439	0.082662	0.068194	0.222527	0.184027	0.168747	0.071004
attached	0.209237	0.437147	0.142523	0.281009	0.312061	0.332984	1	0.617655	1.24E-17	0.563511	0.044542	0.003858	0.334686	0.216417	-0.01861	0.262276
identify	0.348885	0.639619	0.2123	0.243746	0.475928	0.466419	0.617655	1	0.117592	0.387802	0.081953	0.08829	0.314763	0.218001	-0.0231	0.187699
wildlife	0.167326	0.008285	0.376436	0.165703	-0.02649	0.118822	1.24E-17	0.117592	1	0.044948	0.320598	0.611412	0.061167	0.439004	-0.14112	0.389853
dependence	0.214708	0.424743	0.188726	0.329634	0.210302	0.253439	0.563511	0.387802	0.044948	1	-0.00015	0.058235	0.318717	0.295437	0.053934	0.248889
recreational	0.148227	-0.15891	0.438848	0.128753	0.034702	0.082662	0.044542	0.081953	0.320598	-0.00015	1	0.291663	0.075181	0.149823	-0.0293	0.050554
ecological	0.27413	0.081912	0.346059	0.326307	0.114398	0.068194	0.003858	0.08829	0.611412	0.058235	0.291663	1	0.178981	0.389103	0.064355	0.351657
cognitive	0.210996	0.232159	0.166541	0.241085	0.243929	0.222527	0.334686	0.314763	0.061167	0.318717	0.075181	0.178981	1	0.028446	0.142187	0.184303
wilderness	-0.05784	0.200861	0.335801	0.20598	0.012063	0.184027	0.216417	0.218001	0.439004	0.295437	0.149823	0.389103	0.028446	1	-0.12591	0.234477
economic	0.26312	0.056325	-0.02112	0.112006	0.119051	0.168747	-0.01861	-0.0231	-0.14112	0.053934	-0.0293	0.064355	0.142187	-0.12591	1	-0.06976
intrinsic	0.207656	0.108308	0.187731	0.183495	0.100892	0.071004	0.262276	0.187699	0.389853	0.248889	0.050554	0.351657	0.184303	0.234477	-0.06976	1

In the following subsections, a review of the five correlations will be discussed more in depth. Notice in each review, the linear patterns in the diagram below provides an indication of the similarities between the values. The closer the two variables are to each other, or nearer to positive 1, the stronger the correlation.

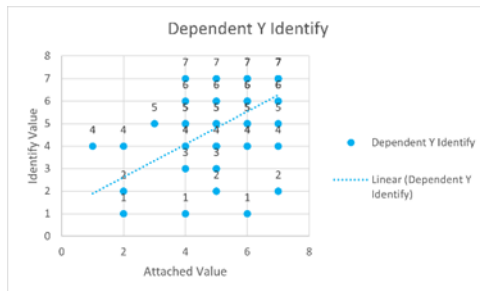
In each review, the linear line that moves diagonally upwards indicates a positive correlation between the pairs. Notice the patterns of similarity between the two values as seen in the data points in Figures 24 to 28. The correlations shows that there were similar sized groups assigning similar point numbers particularly between point numbers 1 to 3, 4 to 6, 2 to 4, or 4 to 7. These patterns suggests people felt similarly for certain place values and subsequently ticked the same point numbers of agreement, disagreement or were neutral towards similar values.

4.2.10.1 Correlation 1: Attached and Identify

The attached variable for the statement “I am very attached to this place” was ranked 6th most important place value. The identify variable for “I identify strongly with this place” was ranked 9th out of 16 values. The R-value is 0.617655. Figure 24 shows that people were rating both values with similar point numbers of 5. The original data shows that 24% or 27 out of 114 respondents ticked point number 5 on the Likert scale for the attached value. Similarly, 21% or 24 people out of 114 respondents ticked point number 5 for the identify variable. There were also similar patterns for point numbers 4, 6 and 7 between the two values indicating that two similar sized groups were rating the attached and identify place values quite similarly.

Figure 24

Graph of Attached and Identify



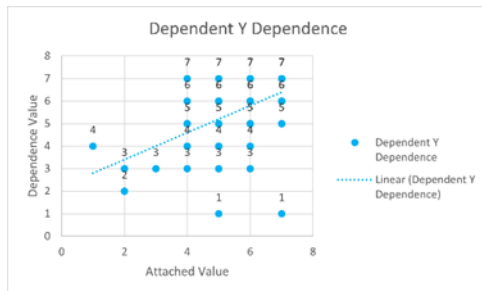
Interestingly too, the identify and attached values are both associated with place identity. The correlation between attached and identify reveals that people feel similarly between the two values. However, since both values ranked 6th and 9th out of 16 values, it was interesting to note that place identity was not considered more important than other place values.

4.2.10.2 Correlation 2: Attached and Dependence

In Figure 25, there is a linear similarity for the point numbers 4, 5, 6 and 7 which indicates that a similar sized group of people were ticking the same point numbers for point numbers 4, 5, 6 and 7 between attached and dependence. The original data shows 15 people ticked 4 in the attached value and for the dependence value, 27 people ticked 5 for attached, while 21 people ticked 5 in the dependence value with similar patterns of group-size similarities for 6 and 7 for both place values.

Figure 25

Graph of Attached and Dependence



This does not mean that the number of people per point number were different to the other. But rather it means that a similar number of people were ticking the same point number in both of the two variables. For example, the original data shows 28 people or 25% of people ticked point number 6 for the attached variable, and 32 people or 28% of people ticked 6 for the dependence variable.

The statement, “I get more satisfaction from visiting this place than any other place” is categorized as place dependence, and the statement “I am very attached to this place” is related to place attachment. The correlations of similar-sized groups ticking 4 to 7 showed that respondents valued place attachment and place dependence similarly. A correlation between these two variables showed that people felt strongly about their relationship between places-to-people or people-to-places.

4.2.10.3 Correlation 3: Spiritual and Identify

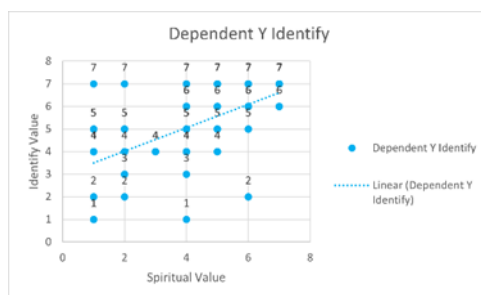
The spiritual variable shows the data points at 4, 5 and 6 in Figure 26. This means that similar group-sized people ticked the same point numbers for the identify variable. The spiritual value has the statement, “I value this place because it is spiritually special to me”, while the place identity statement is, “I identify strongly with this place.” The sentiments of a favourite place

having a spiritual value and similar to place identity is interesting. People's view of spirituality is connected to places that provides a spiritual value.

Similarities of people ticking both variables, spiritual and identify show that people feel similarly as to their identity and spirituality while at their favourite place. This is an important aspect for key stakeholders who needs to be aware of structures that represent spirituality or natural areas that provide a sense of spirituality for people.

Figure 26

Spiritual and Identify



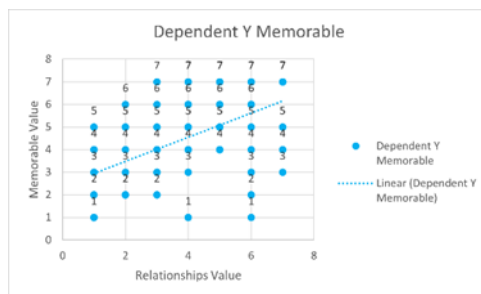
4.2.10.4 Correlation 4: Memorable and Relationship

The correlation between memorable and relationship can be seen in Figure 27 which shows the linear similarity for point numbers 2, 3 and 4. The original data for the memorable variable shows 10 people ticked 2, 8 people ticked 3 and 24 people ticked 4. The relationships variable shows 12 people ticked 2, 11 people ticked 3 and 27 people ticked 4. Again, notice the similarities in similar group-sized people ticking the same point numbers for the two variables of memorable and relationship. The memorable statement, “This place is valuable because it is a place where people can continue to pass down memories, wisdom, traditions or a way of life”, is a historical or cultural value. The relationship statement, “I like this place because of the stories and myths that links me to this place.” is associated with relationships, values to landscape. The point numbers 1 to 3 are on the negative end of the scale. Point numbers 2 is

“Mostly Disagree”, 3 “Somewhat Disagree” and 4 is “Neither Agree nor Disagree”. The correlations between these two values show that more people disagreed that their favourite place was linked to memories, traditions or way of life, or to stories or myths.

Figure 27

Memorable and Relationships

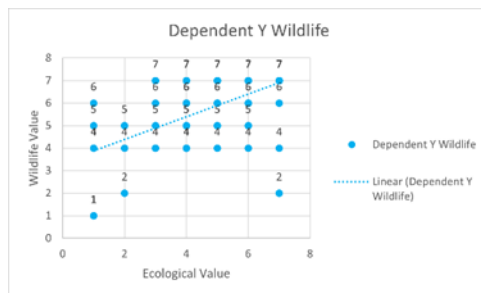


4.2.10.5 Correlation 5: Wildlife and Ecological

In Figure 28 for wildlife and ecological, notice the linear similarities for 5 and 6. The statement for the wildlife value is, “I value these places because they provide a variety of plants, wildlife, and marine life”. The statement for the ecological value is, “These places are valuable because they help produce, preserve and renew air, soil and water.” Wildlife had 19 people out of 114 rate 5 points, and 21 people, 6 points. Ecological had 18 rate this value with 5 points, and 21 people assigned 6 points. People ticked similarly between the two different place values.

Figure 28

Wildlife and Ecological Correlations



The five examples that show correlations for five place values describes the relationships that exists between people-to-places and places-to-people, and how these relationships influences peoples view of place identity, place dependence, and place attachment. A favourite place identifies a person, provides a value to their own selves such as a spiritual need or an cognitive need.

The importance of these place values to people are seen in the five correlations. People perceived some place values similarly to others, especially since these places provided some benefit to them such as air, water, happiness, wildlife, or spiritual fulfilment. These places, however, did not provide agreement in all place values. The correlations of disagreement for memorable and relationships showed that stories, myths or memories of their favourite places were not as more important to them as the other two place identity values of identify or attachment. This might be because passing on stories or myths does not provide as much benefit to them more than what the place offers, such as the enjoyment one gets from a place that identifies them as a person, or as a person dependent on the place.

4.2.11 Principal Component Analysis (PCA)

A principal component analysis breaks down data points from a correlation matrix to compare the original variables of the data set with the observations of the newly created principal

components from the original data set. The PCA process involves reducing the original large data set into something smaller while transforming the new data set into a linear explanation. The PCA formula which is as follows:

$$\frac{\lambda_k}{\lambda_1 + \lambda_2 \dots + \lambda_p}$$

In Table 20, most of the information from the original variables was reduced into the first principle component called “F1” showing a cumulative variance percentage of 26.97. In this section, at least 64% of the variance will be explained by the principal components, which is from F1 to F5. This is because most of the variance is found between F1 to F5 suggesting that the least minimum of components can be explained within the first five principal components. Table 20 shows the difference between each component for the first five components showing the largest percentage of variance is found in F1. The remaining variance of 35.178 is quite small compared to what variance can be explained within five components.

Table 20

Variance between Principal Components

Principal Components	Percentage of Variance
F1	26.972
F1 to F2	15.059
F2 to F3	9.276
F3 to F4	6.919

F4 – F5	6.596
	64.822
Difference	35.178
Total %	100

Eigenvalues are the sum of squared component loadings and represent the amount of variance explained by a given principal component. A variance is always positive. Eigenvectors are calculated by multiplying the square root of an eigenvalue resulting in a component loading. In Table 31, the first five components from F1 to F5 show an eigenvalue greater than 1. This is important, because correlations are closer to 1, whereas eigenvalues closer to zero will imply that there are no correlations due to no similarities between the two variables.

Table 21

Eigenvalues for 16 Principal Components

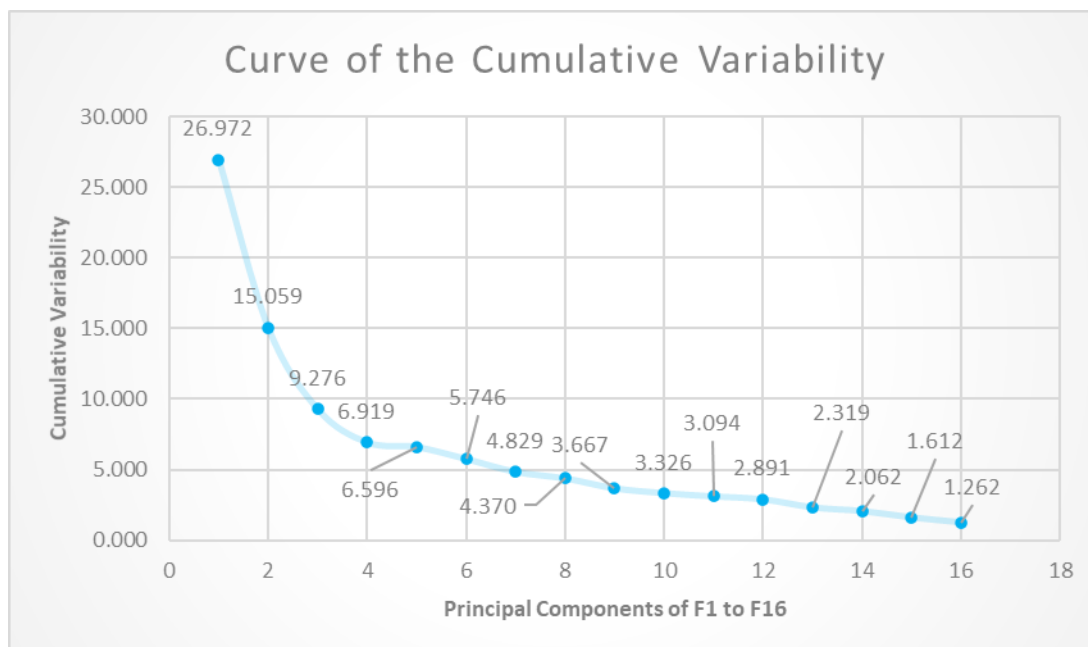
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
Eigenvalue	4.316	2.409	1.484	1.107	1.055	0.919	0.773	0.699	0.587	0.532	0.495	0.463	0.371	0.330	0.258	0.202
Variability (%)	26.97 2	15.05 9	9.276	6.919	6.596	5.746	4.829	4.370	3.667	3.326	3.094	2.891	2.319	2.062	1.612	1.262
Cumulative %	26.97 2	42.03 1	51.30 7	58.22 6	64.82 2	70.56 8	75.39 6	79.76 7	83.43 4	86.76 0	89.85 4	92.74 5	95.06 3	97.12 6	98.73 8	100.00 0

In Figure 29, the blue curve shows the steepness of the curve, beginning at the first principle component of 26.94% variability down to the fourth variability percentage of 6.919%. The bend begins to show at eigenvalue 0.2409 or 15.05% and a line begins after F5 or at 6.596%. The data points shows a direction of the data which is the purpose of the PCA. The graph provides visualisation of the data and it shows the size of the variability of the principle components as the data breaks down into smaller components. The first 4 blue circles shows

the most amount of variance of 58.22, however 64.82% of the variance can also be found within the first 5 nodes and 86.76% of the variance can be found within the first 10 blue circles, which is from F1 to F10. In Figure 29, the line begins to show after the fifth principal component.

Figure 29

Graph of Curve of the Cumulative Variability

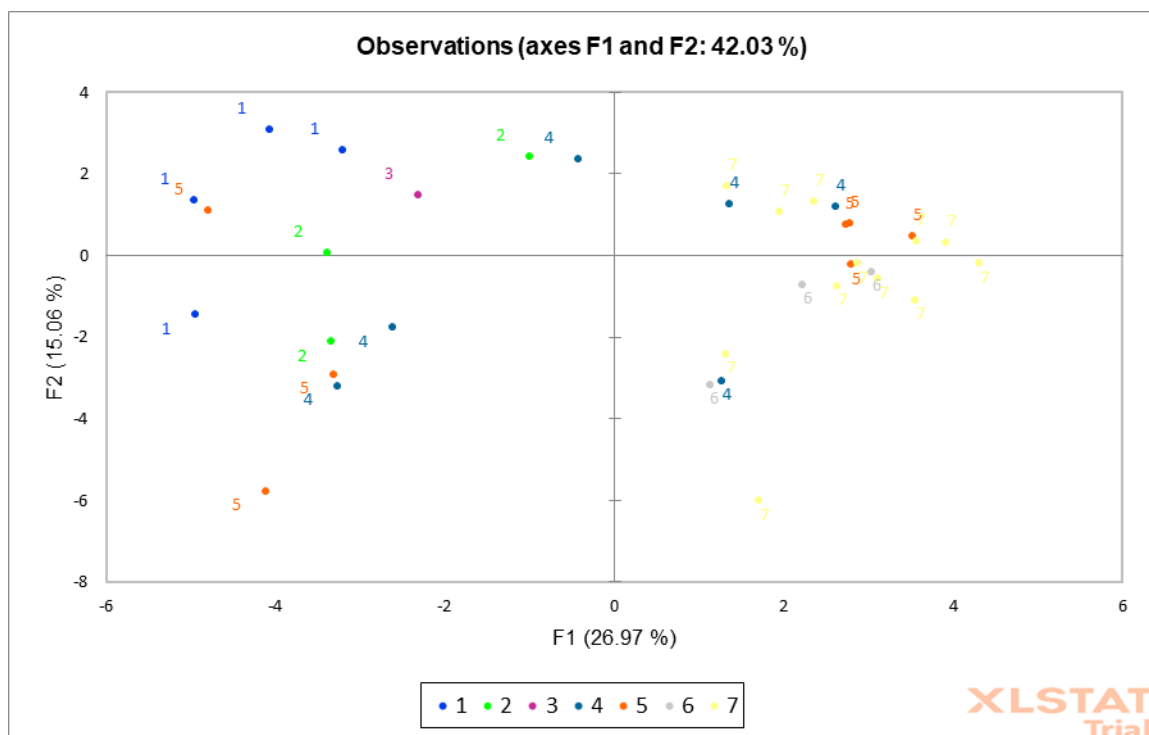


The first 5 principal exponents in terms of the original variables will now be explained. Table 22 shows the principle components from F1 to F5. The eigenvalues are all greater than 1. The first component has the most variability, and when combined the proportion of variance is 64.822% for 5 out of 16 principal components. The variance is usually mostly squeezed into the first component as seen by its first large percentage of 26.972, and then reduces into smaller variances or components across the spread of the 16 components. The first 5 components were created from the original variables.

Table 22*Variance in the first Five Components*

	F1	F2	F3	F4	F5
Eigenvalue	4.316	2.409	1.484	1.107	1.055
Variability (%)	26.972	15.059	9.276	6.919	6.596
Cumulative %	26.972	42.031	51.307	58.226	64.822

In Figure 30, the numbers of the 7-point Likert scale appear in the left and right of the axis of the Observation graph, representing the first two principle components of F1 and F2. Most of the spread of numbers in the new axis for F1 shows only a few number 4's in blue, while there are mostly yellow 7's in the F1 axis.

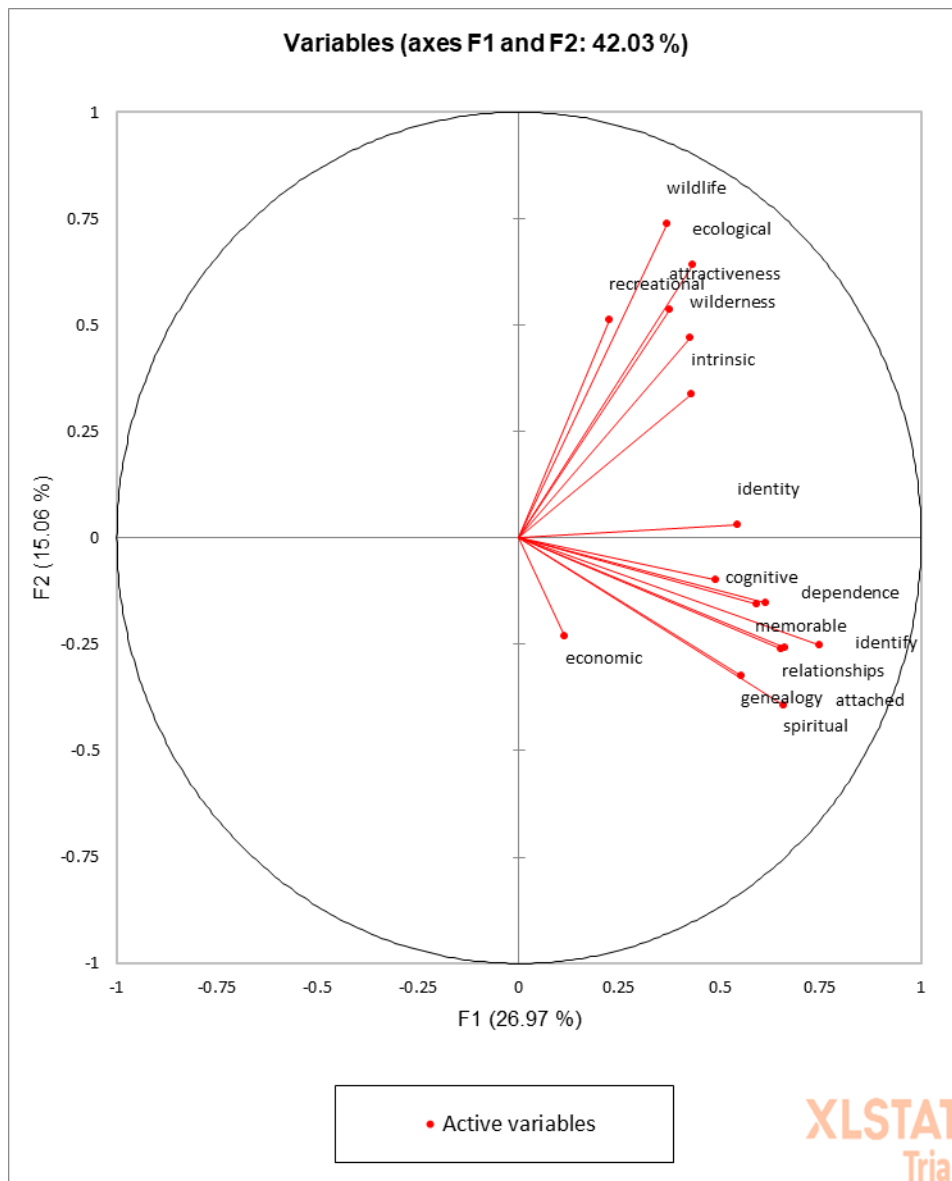
Figure 30*Observation Graph for F1 and F2*

In Figure 30, the lower half of the observation graph shows the values of F2 that were negative variances. These values did not fit the model. The top half of the observation graph shows the values of F1 at the top right and the positive values in column F2 at the top left. The closer they are to each other, whether top or bottom, shows the similarity of the variance between the two or more values. This observation graph only shows the similarity of the variances and not the similarity of values from the correlated data of the original data.

In the Plot graph (Figure 31) the positives are wildlife, ecological, attractiveness, recreational, wilderness, intrinsic and identity which are above 0. Cognitive, dependence, memorable, identify, relationships, attached, genealogy, spiritual and economic are variables below 0 in the lower part of the positive area of the plot graph.

Figure 31

Plot Graph for F1 and F2



Looking at the values in the top right of the Plot graph above 0, notice there are 7 positive sense of place values. In the bottom right of the plot graph axis, in F1, there are 9 positive place values. For the first category, in the top right of the plot graph in F2, there are 4 values between 0.50 and 0.75 above zero. The 4 values are wildlife, ecological, attractiveness, and recreational. A second category can be seen in the middle of the top right graph, between 0.25 and 0.50,

which was the wilderness and intrinsic value. In the third category, there are 9 values in the lower right axis of the graph showing F1 values. These three categories appear to be closer to each other based on how the PCA identified patterns in the data.

For example, the plot graph shows there are two main clusters, and two isolated place values of identity and economic that are not part of either cluster. The place values of the first cluster in the upper F2 positive area, appear to relate to nature and the second cluster in the lower F1 positive area, involve people. The closeness of values in the F1 area shows that the PCA was applying variability to values where people had assigned point numbers to place values they felt were of similar agreement or disagreement to the other, hence their closeness to each other.

An example of this was the identity value, which appears isolated compared to the other place values on the plot graph in F1 and F2 that shows closeness. The identity statement, “This place is valuable because it represents NZ identity” showed that not all people agreed their favourite place represented their New Zealand identity. However, the identify value for the statement, “I identify strongly with this place” on the plot graph showed that people felt more similarly to how they identified themselves and their favourite place as people, as like the other values closer to the identify value.

The Plot graph does not necessarily provide an explanation of which values were preferred more than others, but rather how people scored each value according to whether they disagreed and or agreed with the statement, and their views on the similarity of place values as being like the other. It does not provide a ranking of values from most important to least important like the bar graph earlier shown in Section 4.2.7. Rather, the PCA tests showed how people felt about the 16 values in terms of similarity of agreement or disagreement of place values they felt were about the same as the other.

Also, the two main clusters of nature and people show the interaction between places-to-people and people-to-places (Manzo, 2003), and that this relationship exists when people feel strongly about nature and themselves. Furthermore, the human behaviour of agreement and disagreement for similar place values, or their feelings about themselves in connection to places and nature can be explored further in the future to understand why people disagreed with certain place values, and what does the degree of disagreement reveal about place statements.

4.2.12 Factor Loadings

Factor loadings also show correlations between PCA components. In the PCA test, the eigenvector was multiplied by the eigenvalue (per component) square root to generate the factor loadings. The factor loadings in Table 23 shows the correlations for each 16 items in the first column. For example, the first item, memorable has an eigenvector value of 0.284 which was then multiplied by the eigenvalue of 4.316 for an F1 component, then the square root on this eigenvalue, produced the new factor loading of 0.590.

The positive values in F1 showed there were correlations with the first item, memorable with the first component of 0.590 and so forth for all of the positive values across the components. Also in Table 23, notice the large positives with values that were rated high. The very high numbers were wildlife, spiritual, relationships, attached and identify which had a square root sum in the 0.700 range. The middle range of 0.500 appears to be genealogy, memorable and identity in the first column.

Table 23

Correlations between Variables and Factors

Value	F1	F2	F3	F4	F5
memorable	0.590	-0.157	0.558	-0.071	-0.158

spiritual	0.657	-0.393	-0.158	-0.126	-0.252
attractiveness	0.375	0.535	-0.031	0.489	0.157
identity	0.544	0.032	0.115	-0.323	0.160
genealogy	0.553	-0.325	0.256	0.166	-0.206
relationships	0.652	-0.262	0.264	0.091	-0.308
attached	0.662	-0.257	-0.406	0.133	0.180
identify	0.747	-0.251	-0.198	0.231	-0.185
wildlife	0.368	0.737	0.056	-0.154	-0.214
dependence	0.614	-0.154	-0.380	-0.060	0.337
recreational	0.225	0.513	0.256	0.578	0.100
ecological	0.434	0.641	0.268	-0.281	-0.007
cognitive	0.491	-0.098	0.045	0.044	0.568
wilderness	0.427	0.471	-0.376	-0.096	-0.175
economic	0.115	-0.231	0.586	-0.137	0.421
intrinsic	0.429	0.337	-0.147	-0.407	0.109

4.2.13 Random Sampling

Random sampling allows tests to be conducted on smaller samples from the parent population. Five random samplings were conducted to test age, gender and a comparison of values within the New Zealand data set. A small set of 14 respondents from New Zealand were also sampled randomly to use as a comparison with a Welsh data set that participated in Survey Three which will be discussed in brief later on.

4.2.14 Sample 1: Males Compared to Females.

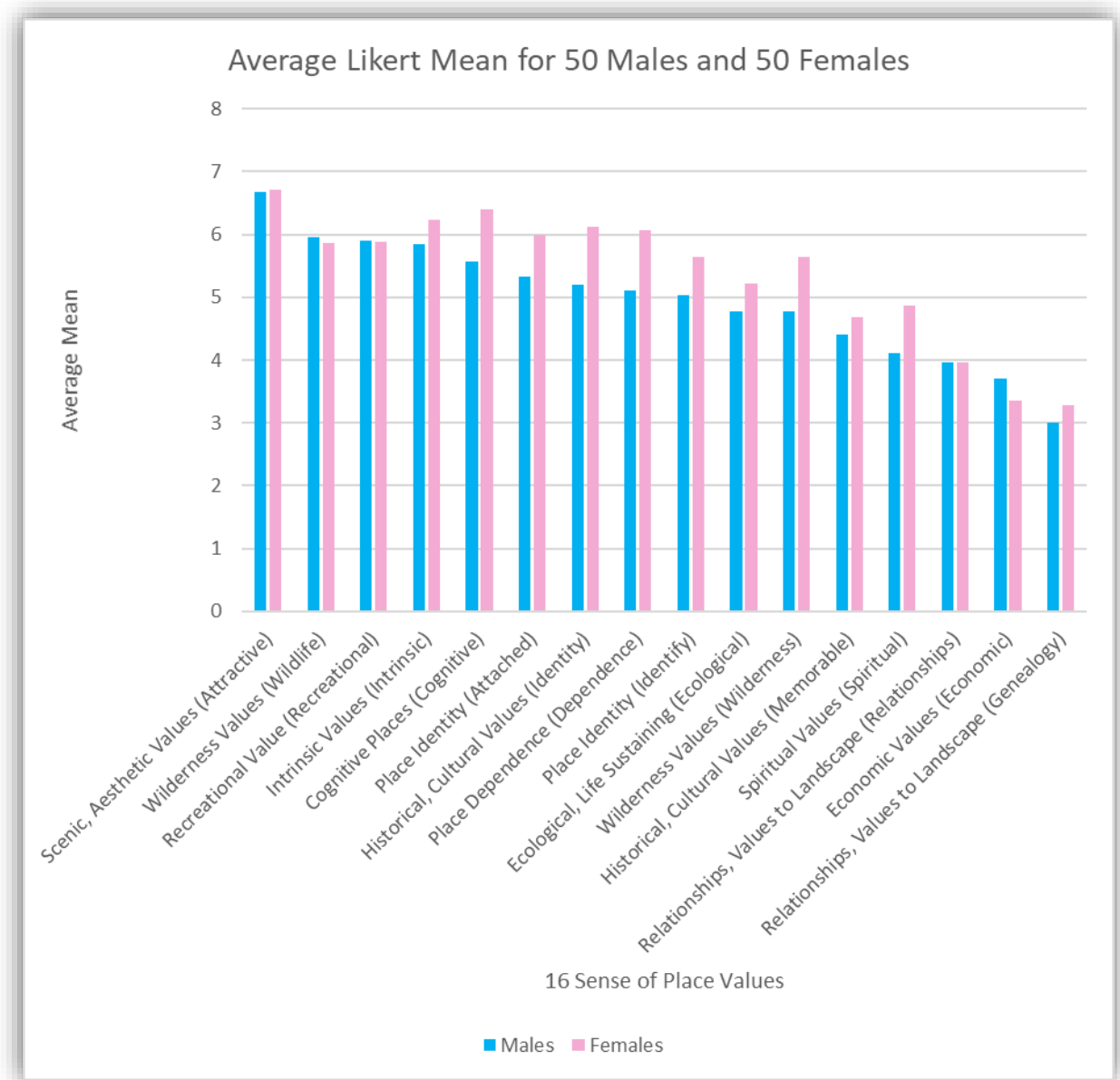
The first sample consisted of 50 males and 50 females from the 114 people in the New Zealand dataset and were randomly chosen using the random Excel function. This was to find correlations between males and females. The findings reveal the following:

- Average Likert mean score for all 16 place values for males is 5.00.
- Average Likert mean for all 16 place values for females is 5.40.
- Females rated twelve values more highly than the males. They were attractiveness, intrinsic, cognitive, attached, identity, dependence, identify, ecological, wilderness, memorable, spiritual and genealogy.
- Males rated three values more highly than the females. They were wildlife, recreational and economic values.
- Males and females valued relationships equally the same.
- There is a strong positive correlation between males and females with an R-value of 0.9227.
- Males and females ranked the attractive value the highest.
- Genealogy was ranked the lowest by both men and women.

The bar graph in Figure 32 shows the preferred value in descending order for males compared to females.

Figure 32

Bar Graph of 50 Males and 50 Females



4.2.15 Correlations Between Men and Women

There were correlations between men and women which showed high positive correlations of 0.922734. In Figures 33 and 34, there is a strong linear similarity between the genders.

Figure 33

Correlation Graph Between Males and Females

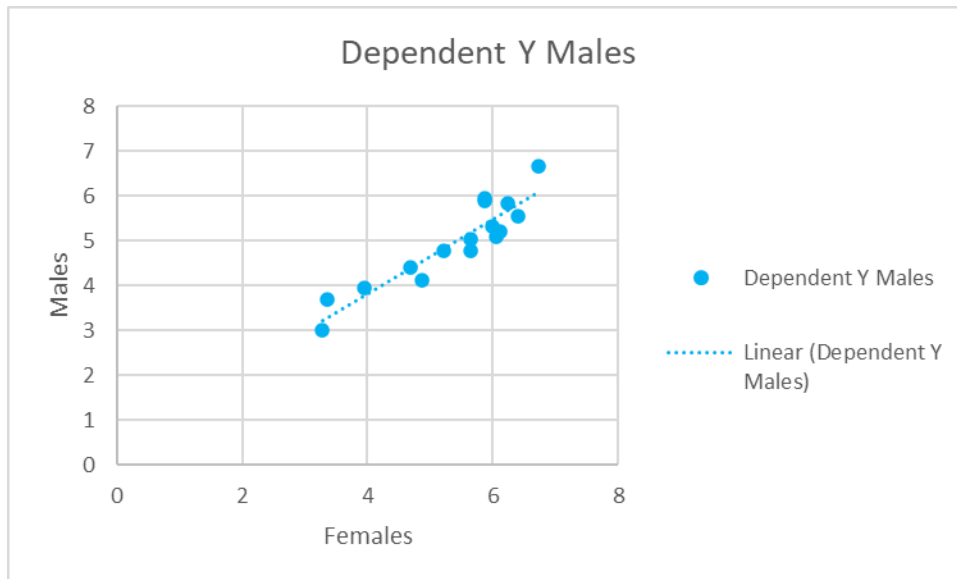
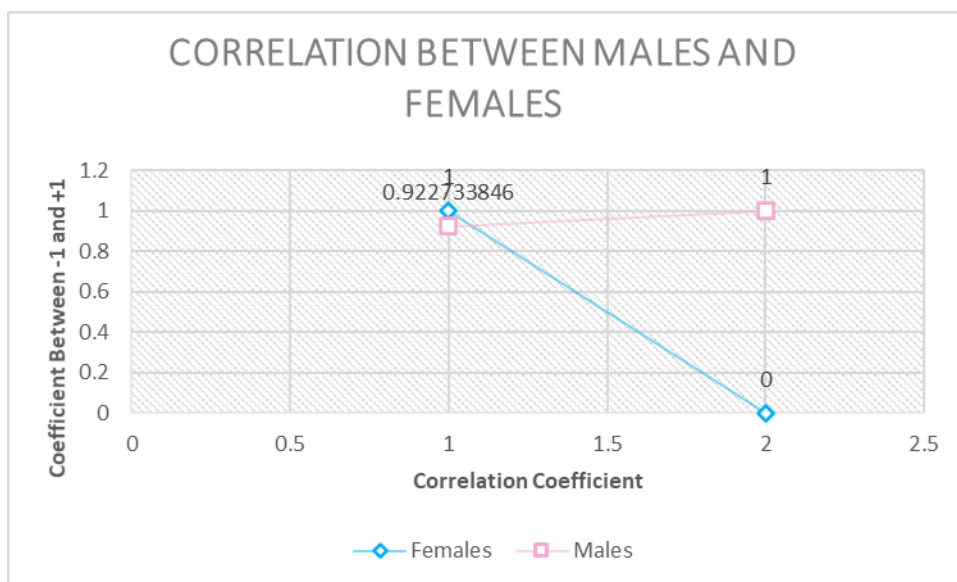


Figure 34

Correlation Between Males and Females



4.2.16 Sample 2: 20 to 29 Year Olds – 20 Respondents

The following findings for Sample 2 are:

- Average Likert mean score is 5 rounded (5.015625).
- There is a strong correlation between 20 to 29 year olds and 30 to 39 year olds at 0.903962.
- There is a strong correlation between 20 to 29 year olds and 40 to 49 year olds at 0.910407.
- There is a correlation between 20 to 29 year olds and 50 to 59 year olds at 0.890147.

4.2.17 Sample 3: 30 to 39 Year Olds – 20 Respondents

The following findings for Sample 3 are:

- Average Likert mean score is 5 rounded (4.9875).
- There is a correlation between 30 to 39 year olds and 40 to 49 year olds at 0.85731.
- There is a correlation between 30 to 39 year olds and 50 to 59 year olds at 0.820794.

4.2.18 Sample 4: 40 to 49 Year Olds – 20 Respondents

The following findings for Sample 4 are:

- Average Likert mean score is 5 rounded (5.21875).
- There is a correlation between 40 to 49 year olds and 50 to 59 year olds at 0.965665.

4.2.19 Sample 5: 50 to 59 Year Olds – 20 Respondents

The following findings for Sample 5 are:

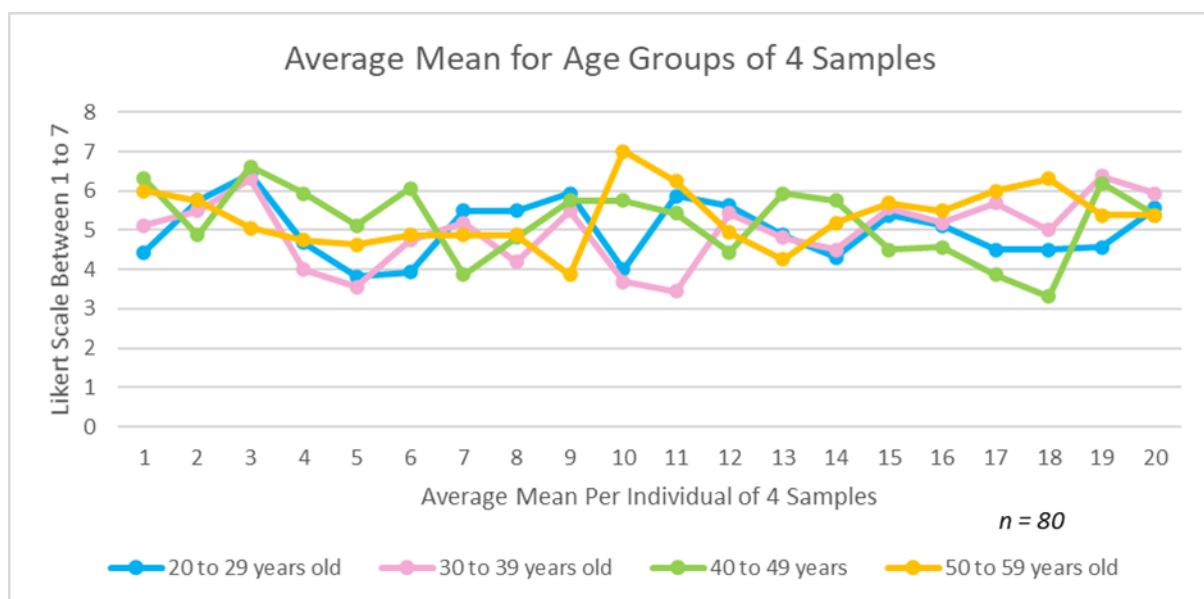
- Average Likert mean score is 5 rounded (5.328125).
- There is a strong correlation between 50 to 59 year olds and the entire data set of 114 respondents at 0.948998.

In Figure 35, the line graphs show the average mean for each respondent in the random sampling of 20 men and 20 women. A respondent in the 50 to 59 years old sample had the

highest average Likert mean of 7 per individual. Also, a respondent in the 40 to 49 years sample had one of the lowest average Likert mean per individual.

Figure 35

Average Likert Mean Score for Ages Across 4 Random Samples

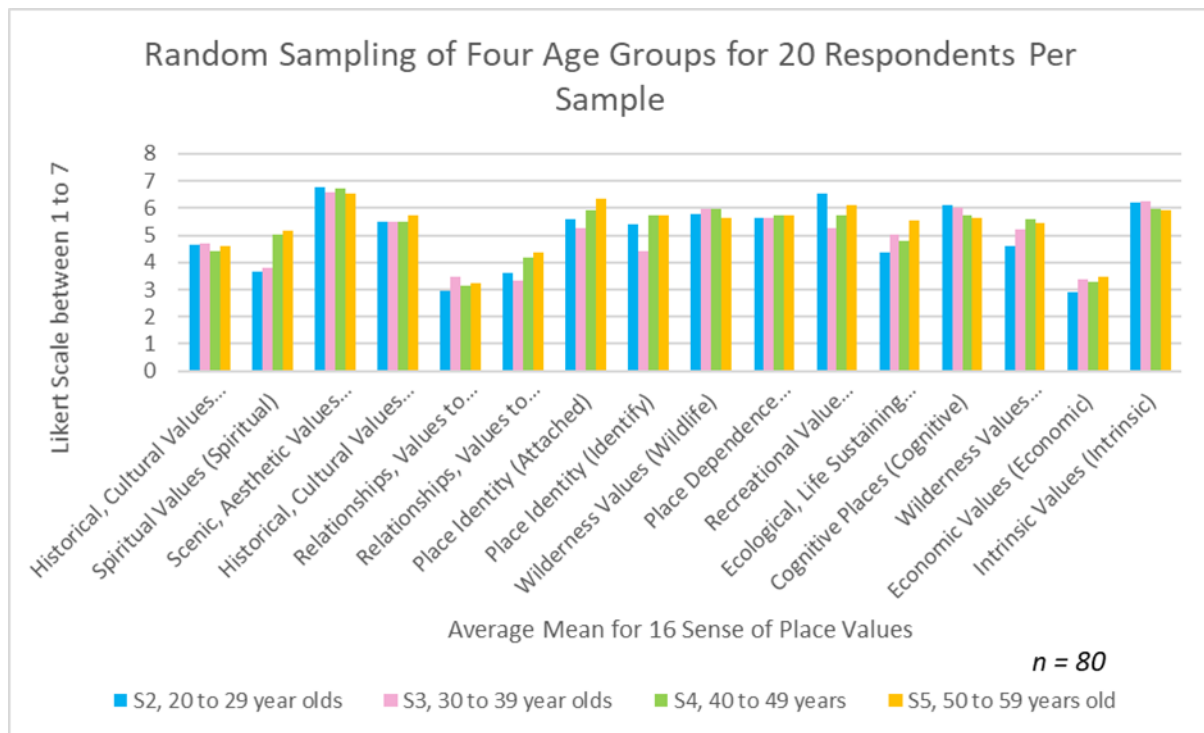


4.2.20 Total Group Average Likert Mean for 16 Place Values

Figure 36 shows place values preferred by Sample 2, Sample 3, Sample 4 and Sample 5.

Figure 36

Average Likert Mean Score for Place Values Across Four Random Samples



4.3 Part D : Survey Three - Secondary Study in Wales

A survey link was distributed through contacts in Wales by email to friends, students, work colleagues and 14 people responded. The map below (Figure 37) shows the locations of favourite places in Wales from 14 respondents.

Figure 37

Map of 14 Favourite Places in Wales



The gender and ages of the Welsh study is displayed in Figures 38 and 39 below. Twelve of the respondents were citizens or residents of Wales, while the other two respondents were not.

Figure 38

Gender in the Wales Study

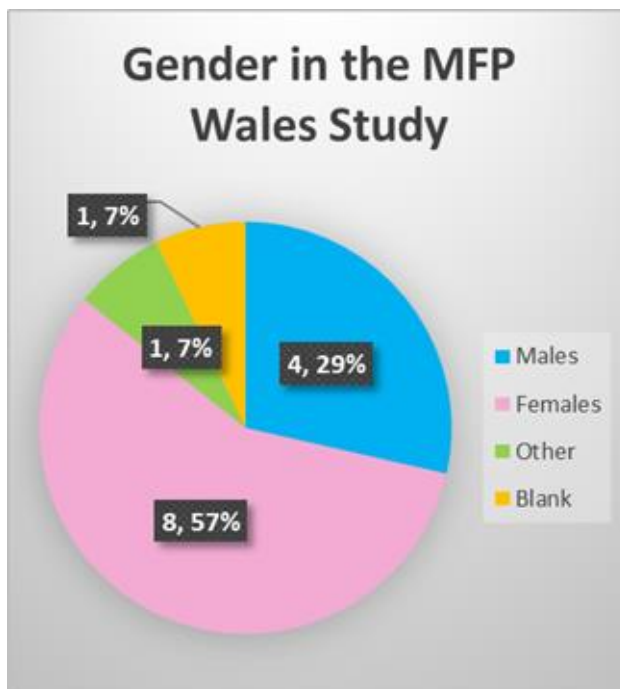
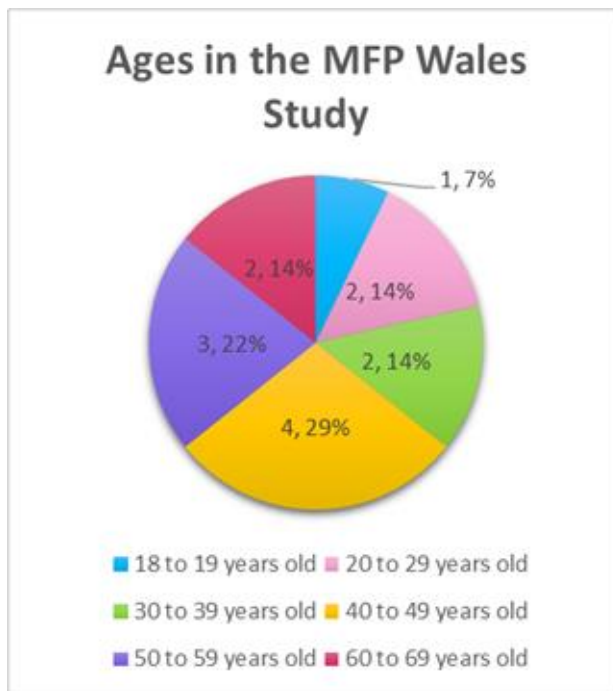


Figure 39

Ages in the Wales Study



4.3.1 Random Sampling from NZ

The 14 respondents from Wales were then compared to 14 randomly chosen people from the New Zealand data set to find any correlations from the two countries. All 14 people were citizens or residents of New Zealand. Their gender and ages are displayed in Figures 40 and 41.

Figure 40

Ages in the Random NZ Sample Set

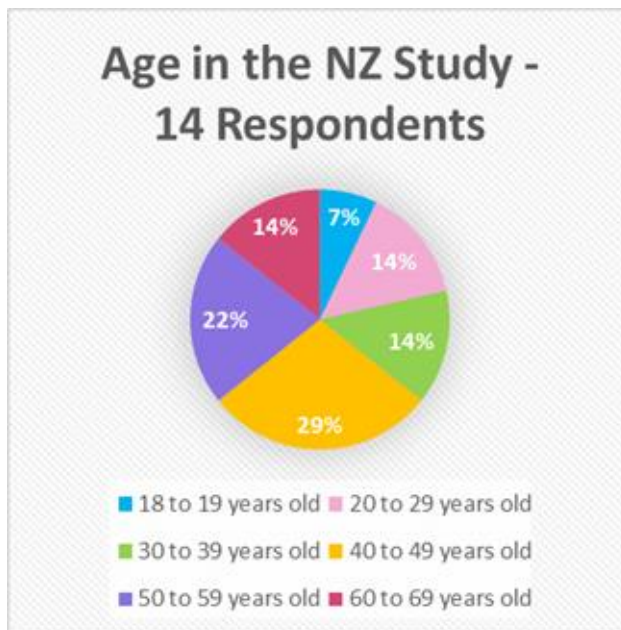
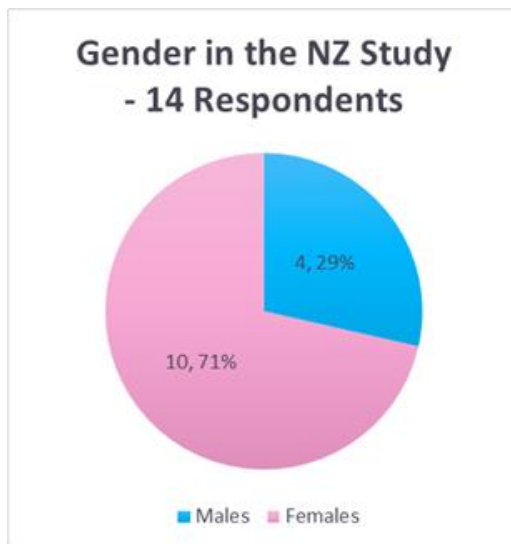


Figure 41

Gender in the Random NZ Sample Set



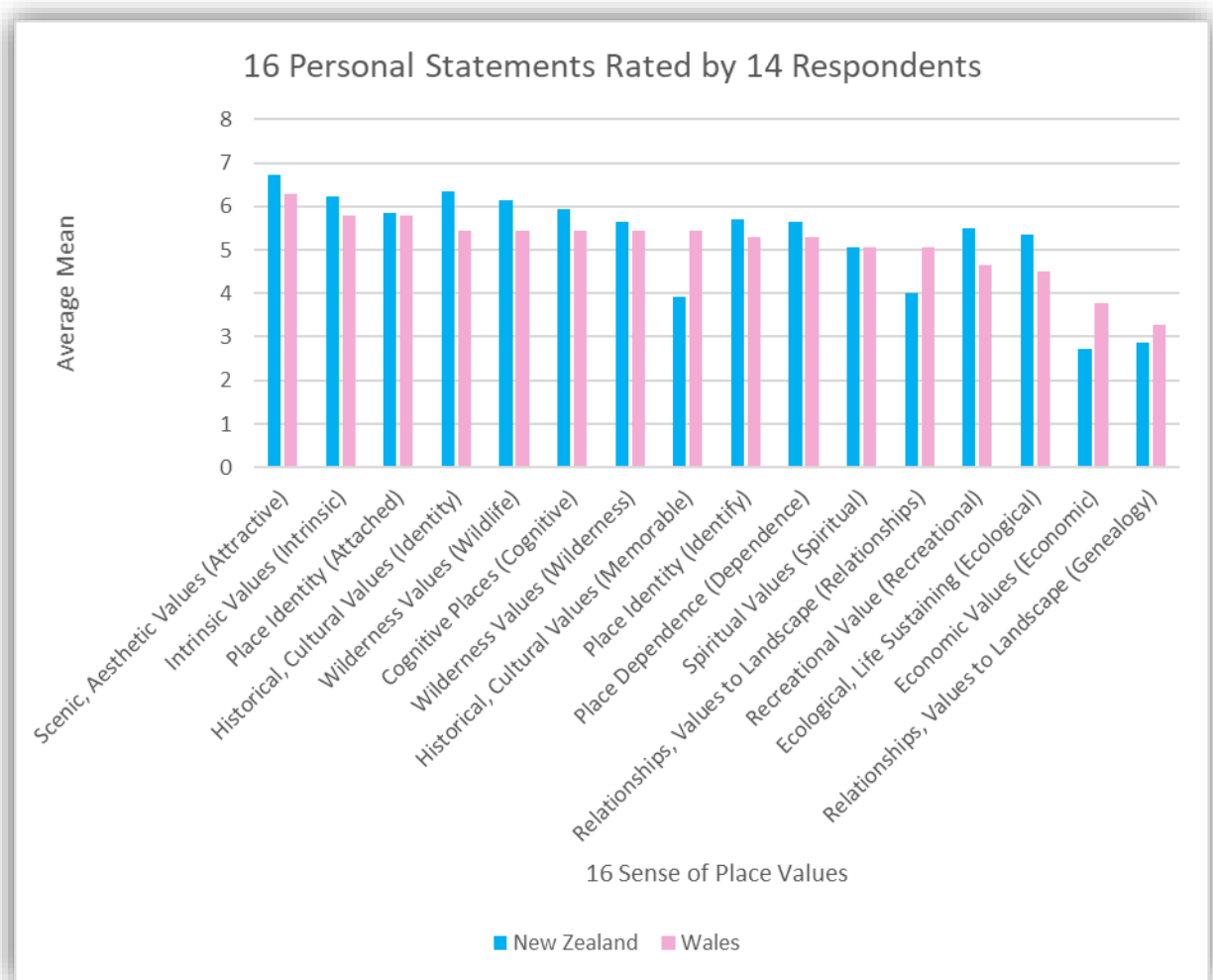
4.3.2 Preference for Values in Wales

The highest ranked value in Wales was the scenic, aesthetic values of 6.286 (6 rounded). The second highest value was both the intrinsic value of 5.786 (6 rounded), and the attached value

also at 5.786 (6 rounded). The next 5 values of cognitive, identity, memorable, wildlife, and wilderness all shared the same mean of 5.429 (see Figure 42).

Figure 42

16 Values in the Wales Study



In Figure 42, the lowest place value for Wales, in the pink colour, was the genealogy value at 3.286. Similar to New Zealand, Wales most preferred value was the scenic, aesthetic value followed by intrinsic, and the attached value. Place identity (identify) and place dependence (dependence) was fourth equal. The three lowest values in Wales was ecological, economic and genealogy. The word cloud in Figure 43 show some comments made by the respondents.

Word Cloud of the nouns used in the Wales dataset



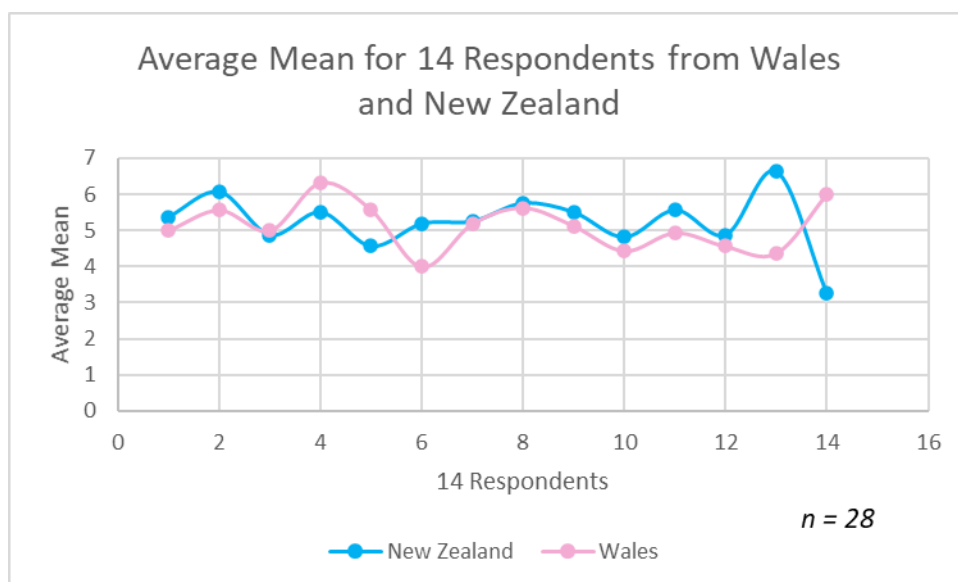
4.3.4 Findings

- 155

- There are correlations between Wales and all of the eight remaining sample sets. Of interest, the two strongest correlations is between Sample 4 of 40 to 49 year olds of New Zealand and Wales with an R-value of 0.849868506.
- There is a strong correlation between 50 to 59 year olds of New Zealand and Wales with an R-value of 0.800465163.

Figure 44

Average Likert Mean for 14 Respondents from NZ and Wales



4.3.5 Comparison of 16 Values with 9 Samples

As the correlations matrix table shows, there are correlations across all nine samples (see Figure 45). Of note, were the two highest correlations as follows:

- There are strong correlations between males and females of 0.9227.
- There are strong correlations between 50 to 59 year olds and 40 to 49 years old of 0.9656.

Figure 45

Correlations Between Samples

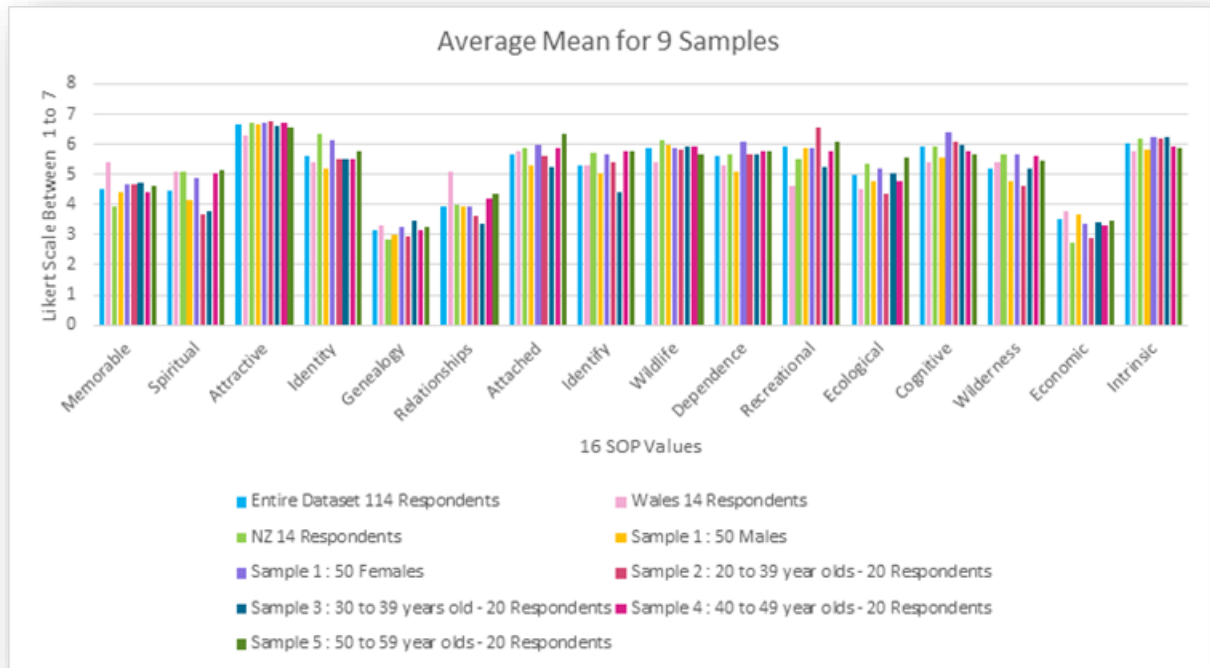
	Entire Dataset 114 Respondents	14 Respondents	NZ 14 Respondents	Sample 1 : 50 Males	Sample 1 : 50 Females	Sample 2 : 20 to 39 year olds	Sample 3 : 30 to 39 years old	Sample 4 : 40 to 49 year olds	Sample 5 : 50 to 59 year olds
Entire Dataset 114 Respondents	1								
Wales 14 Respondents	0.796909	1							
NZ 14 Respondents	0.945402	0.809059	1						
Sample 1 : 50 Males	0.978542	0.761372	0.887467345	1					
Sample 1 : 50 Females	0.981827	0.81313	0.967200972	0.922734	1				
Sample 2 : 20 to 39 year olds	0.966873	0.732936	0.860909796	0.958111	0.934581	1			
Sample 3 : 30 to 39 years old	0.937703	0.722855	0.858929257	0.914497	0.920826	0.903962	1		
Sample 4 : 40 to 49 year olds	0.967007	0.849869	0.964908233	0.926892	0.969123	0.910407	0.85731	1	
Sample 5 : 50 to 59 year olds	0.948998	0.800465	0.953269557	0.901531	0.955087	0.890147	0.820794	0.965665	1

In Figure 46, note the similarities of distribution across all 16 values. Not only was the average Likert mean 5 for all samples, the distribution per value, indicates that the general population felt the same way for the 16 values. However, there were other interesting findings as seen in the bar graph below such as:

- Wales sample shows this group liked the memorable and the relationship value more than any other group.
- Sample 3 : 30 to 39 year olds like the recreational value more than any other group.
- Sample 2 : 50 females scored the cognitive value more than any other group.
- Sample 5 : 50 to 59 year olds scored the attached value more than any other group.
- All nine samples liked the intrinsic value.
- The genealogy value and the economic value had low average Likert means by all nine samples.

Figure 46

Average Mean for 9 Random Samples



4.4 Locations, Activities and Descriptions

The locations received from Survey Two offered more than just a review of people's views of landscape values. The locations need to be visualized spatially in maps. Also, the text comments and text place names that referred to the locations, need to be textually interpreted through software tools. In this section, there were several approaches used. Firstly, a general analysis of 114 locations is made using the ArcGIS online map tools. This is important as Lai et al. (2019) asserted that locations are associated to points which are spatial units representing locations (Lai et al., 2019).

Secondly, text descriptions of people's favourite places were analysed through an online machine learning software application called Parts-Of-Speech (POS), to identify the activities of people through the use of nouns. POS is an online tagger tool that was designed and developed from the Stanford University (Parts-Of-Speech, n.d.). POS separates text into categories of grammar, such as categorizing nouns, adverbs, verbs, adjectives, conjunctions, determiners, numbers, prepositions, and pronouns. Separating text descriptions, such as the nouns used by the comments made by respondents is useful to identify and analyse people's activities.

Thirdly, AntConc (The Grammar Lab, n.d.), a concordance analyser was used to create and build a corpus for "The My Favourite Place" project. The corpus is new though small and likely to build as the months and years continue. AntConc is transparent, and is a simple and effective method to find keywords through its keyword algorithms. Keywords are words that were frequently used in a corpus and are ranked in order based on its keyness value. As part of keyword search methods, the keyness settings values used in AntConc searched keywords based on a Log-Likelihood (4-term) algorithm, with a threshold of a confidence level of $p < 0.05$ (+Bonferroni), using the Dice coefficient as the keyword effect size measure of Evert's μ value, and a keyword effect size threshold of "All Values".

Finding methods to identify terms is common in place-based research. For example, place-said or place-related terms were identified through using the Ripley's K function in a location-led study (Lai et al., 2019). Finally, word clouds were generated for visualisation using Monkey Learn (Monkey Learn, n.d.), an online text analysis and machine learning tool that also offers a word cloud generator tool. A more in depth coverage of topic modelling and geospatial review of land cover could be explored as a future separate study. In the meantime, Section 4.4 will provide a general analysis of locations, activities and descriptions of favourite places collected for this study through maps and word clouds.

4.4.1 Locations

There were 114 favourite places (locations) submitted in Survey Two (see Figure 47). There were 66 locations in the North Island, 38 in the South Island, and 10 islands within the territory of New Zealand. The reason for separating “islands” as a category of its own was because islands of New Zealand are not part of the mainland, such as Pitt Island, Ulva Island, Mokoia Island, Hauturu Island or Disappointment Island. In Figure 47 below, the green circles show the locations of favourite places by the respondents. The locations are distributed throughout the country, indicating that the data collected was unbiased. Much of the social media postings were done in Reddit, Facebook, Twitter, Instagram, Flickr, Pinterest, Tumblr, and Linked In. Audiences included local and international users.

Figure 47

114 Locations (ArcGIS, n.d.)



Of note, the locations were not categorised according to its environment. There were several issues in this area. There are many existing research methods and frameworks that can help analyse place-based research data correctly. For example, in the journal, *“A name-led approach to profile urban places based on geotagged Twitter data”*, the authors created two frameworks, a location-led framework and a name-led framework (Lai et al., 2019). Their study analysed Twitter tweets of users in Camden Borough, London. Firstly, the authors used place names found in their geo-referenced twitter text and estimated spatial points of areas extracted from Twitter using a cluster spatial algorithm to conduct a spatial analysis, and then matched or compared those estimated spatial extents to points of interest located in the Foursquare map application software (Lai et al., 2019). Secondly, the authors then analysed the text data to find out their activities and events in order to create a place profile (Lai et al., 2019) as part of their place-based analysis.

A consideration was made as to whether to categorize the locations according to the Millennium Framework (Alcamo & Bennett, 2003) to urban, coastal, or forest categories. But the categorizations were specific and a level of high accuracy would be required to ensure the categorization was correct. Also, discussion of using existing GIS systems such as QGIS (Quantum Geographic Information System) or ArcGIS, which uses a standard naming convention of what is classified according to its landscape feature was also considered. However, a general land classification might obscure the specific location if in fact it was a woodland and not a forest, a beach and not an ocean, a mountain or a hill. While some land categories could be made, other categories might have been vague and it would have required manual annotations and some time to ensure the classifications were correct especially when measurements of altitude, elevation or sea depth is required for accurate data classifications.

Instead, the locations are explained through the activities and descriptions of comments made by respondents. Therefore, the findings for locations are:

- 58% of favourite places are in the North Island.
- 33% of favourite places are in the South Island.
- 9% of favourite places are islands within the New Zealand territories.

Using Monkey Learns' Word Cloud Generator (Monkey Learn, n.d.), the word cloud below provides a visualization of some of the names of these favourite places or locations as shown in Figure 48.

Word Cloud of Locations, Place Names (Monkey Learn, n.d.)



163

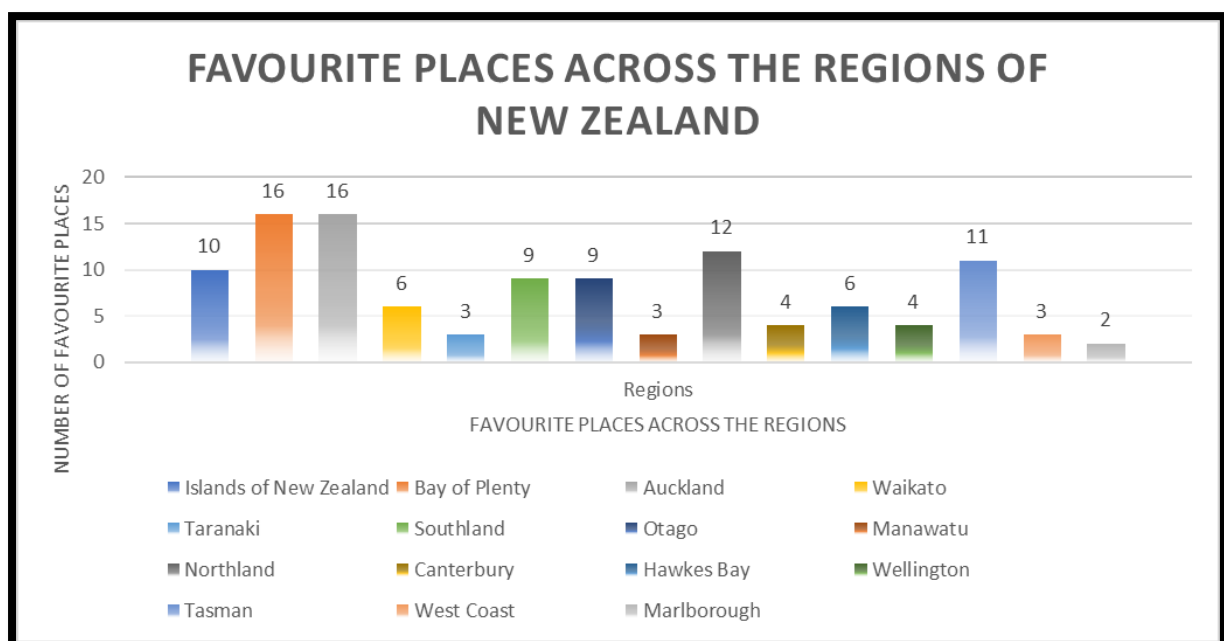
differentiate the environment from locations situated on the mainland, and to compare people's place values for islands to the other regions.

Top favourite places were found in the Auckland, Tasman and in the Bay of Plenty Regions of New Zealand. All three regions are located along the coasts of New Zealand. Not far behind was the Northland Region which is also a coastal area. The following findings are based on the entire New Zealand dataset of 114 respondents and locations:

- 14% of favourite places are located in the Bay of Plenty and the Auckland Regions.
- 11% of favourite places are located in the Northland Region.
- 10% of favourite places are located in the Tasman Region.
- 9% of favourite places are islands within New Zealand.
- Favourite places were found in at least 15 regions across New Zealand.

Figure 49

Favourite Places Across New Zealand



4.4.1.2 *Place Values Across All Regions*

However, though there were more favourite places chosen such as in Auckland or in the Bay of Plenty as seen in Figure 49, the Likert mean scores once averaged showed some of the other regions had higher average Likert mean scores than Auckland (See Figure 50). For example, the average Likert mean score for Northland was higher than Auckland even though there were more locations chosen in Auckland as people's favourite places. This suggests that while people liked more locations in Auckland or in the Bay of Plenty (BOP) than the other regions, the average Likert mean score when averaged, showed favourite places that were rated more highly than Auckland. For example, the highest average Likert mean score across all regions was:

- Northland with the highest average Likert mean of 5.708 (12 respondents).
- Canterbury had the second highest average Likert mean of 5.5625 (4 respondents).

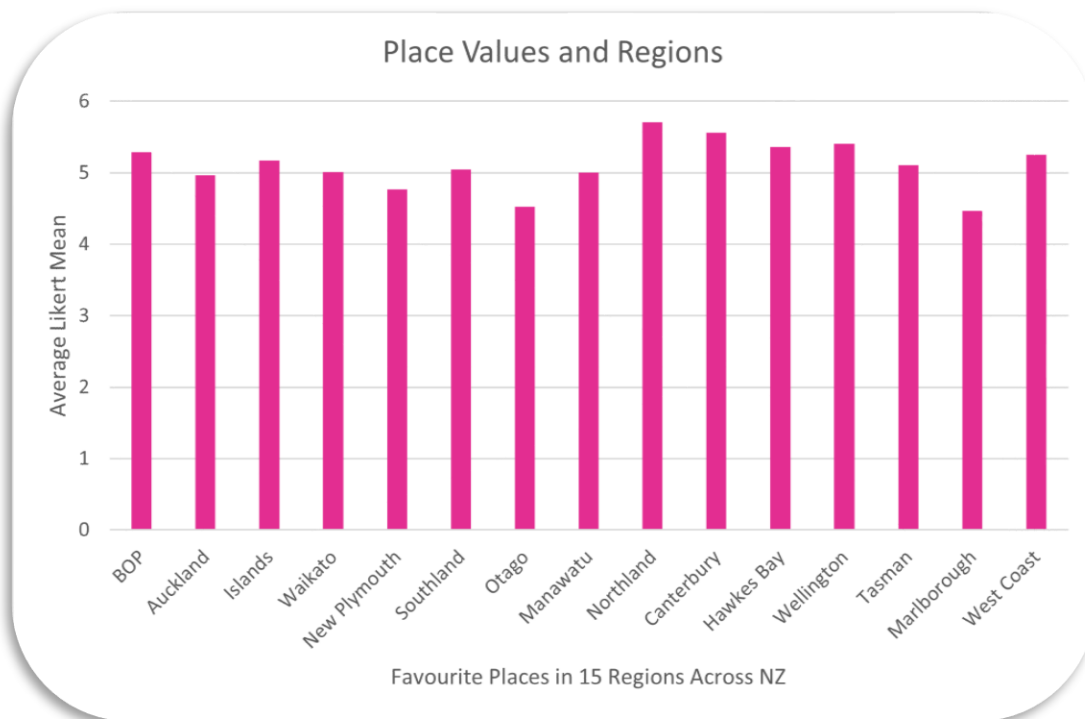
4.4.1.3 *The highest average mean for Place Values within the Regions*

Within each region as shown in Figure 50, the number of people who rated their favourite place according to specific place values showed the following findings. Top place values per region are:

- The attractive value for Canterbury had the highest mean of 7 (4 respondents).
- The attractive value for Marlborough had the highest mean of 7 (2 respondents).
- The attractive value for West Coast had the highest mean of 7 (3 respondents).
- The cognitive value for West Coast had the highest mean of 7 (3 respondents).
- The attractive value for Taranaki had the highest mean of 7 (3 respondents).
- The attractive value for Manawatu had the highest mean of 7 (3 respondents).

Figure 50

Average Mean Across Regions and Islands



4.4.1.4 Findings for 114 Locations and 15 Regions

The findings for Section 4.4 were many and exciting. The data shows where favourite places are in New Zealand and why they value these places.

The findings are:

- Northland had the highest average mean of 5.708 across all regions of New Zealand.
- Canterbury had the second highest average mean of 5.5625 across all 16 place values.
- Marlborough's highest mean was 7 for the attractive value.
- West Coast's highest mean was 7 for the attractive and the cognitive value.
- There were 5 regions whose highest mean was 7 for the attractive value:
Marlborough, West Coast, Canterbury, Taranaki and Manawatu.

Based on the findings above, people value places of beauty. The West Coast region was also valued for its cognitive value.

4.4.2 Activities

In the study, the main focus was of building a favourite place-led framework that would find favourite places in New Zealand. The search would include establishing the name of the place, the location, their reasons for choosing that place, and their reasons why it was their favourite place. In their comments, basic extraction of their activities (nouns) and descriptions (their use of adjectives), would also provide a way of finding out what people valued at those places and why they valued those places more than others.

According to Adams and McKenzie (2013), people's favourite places were attributed to five main categories: place name, the location, the activities they engaged in, the descriptions of that place and the type of environment of that place. Adams and McKenzie (2013) asserted that within travel blogs, topics emerged from their activities, localities, features and other miscellaneous topics (as cited in Bahrehdar & Purves, 2018).

In the study, there was also a need to know what types of activities people engaged in while at their favourite place. In the online survey form there were two questions that were designed as text box inputs. The two questions were:

1. What is your favourite place in New Zealand?
2. Why is this your favourite place?

These two questions provided an opportunity for respondents to write as much as possible. Once received, the comments were uploaded into the MFP corpus and separated using the POS tagger tool. Separating text into parts of speech helped identify activities through use of nouns, and descriptions through use of adjectives.

4.4.2.1 *Findings for Activities for 62 Locations*

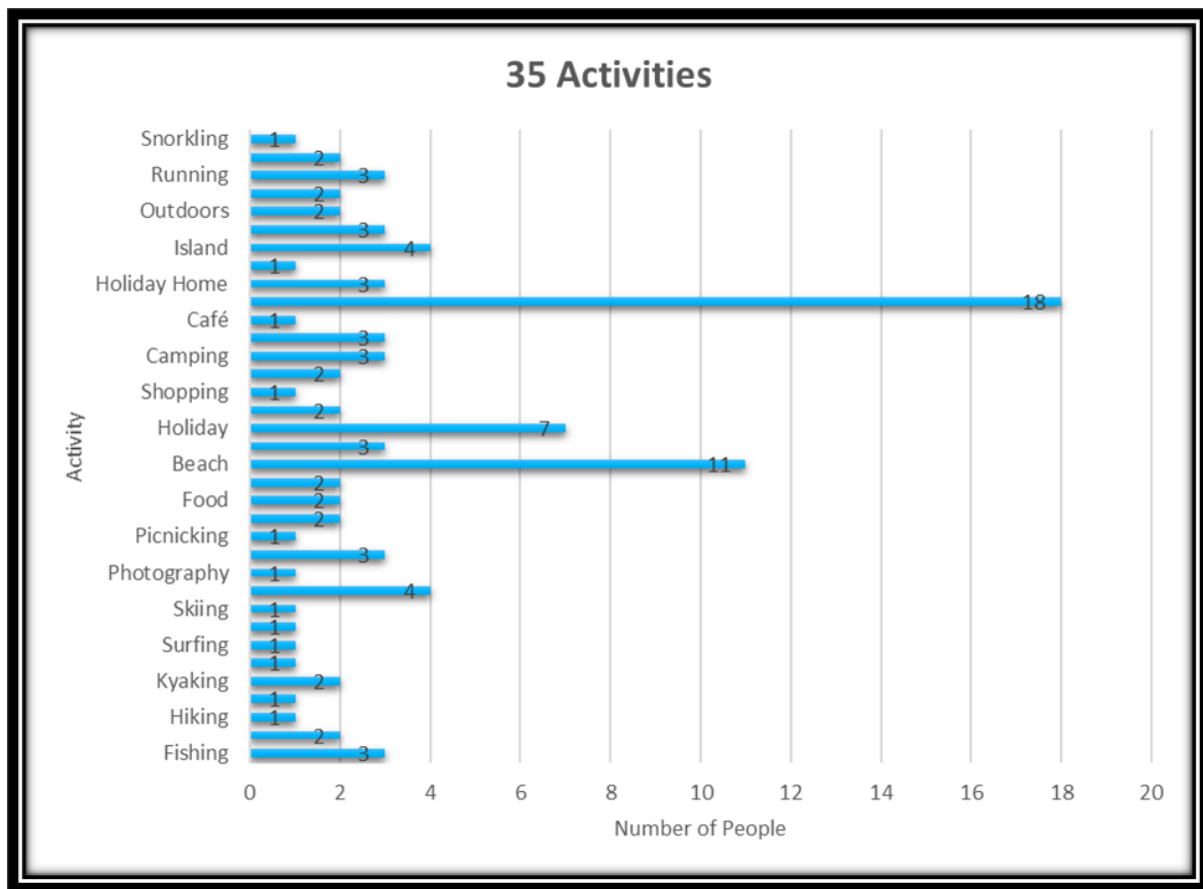
At 62 locations making up 54% of favourite places, people engaged in 35 activities. The findings for activities are:

- 18% of people engaged in walking activities.
- 11% enjoyed going to the beach.
- 4% liked bird watching.
- 3% liked camping.
- 7% liked their favourite place because they had spent a holiday there.
- 2% liked their favourite place because they were engaging in competitive sport there.
- 4% liked going to an island to see birds and sites.

Activities were manually identified through the use of nouns which was separated from the POS tagger tool. A manual count was made showing there were 100 occurrences of 62 respondents engaging in 35 different types of activities (see Figure 51).

Figure 51

35 Activities Identified Favourite Places



Also, the map in Figure 52 shows the locations of places where activities took place.

Figure 52

Locations of Activities (ArcGIS Online, n.d.)



And finally, a word cloud in Figure 53 was generated from the nouns in the MFP corpus, showing the comments from 62 people who had engaged in some 35 different activities.

Figure 53

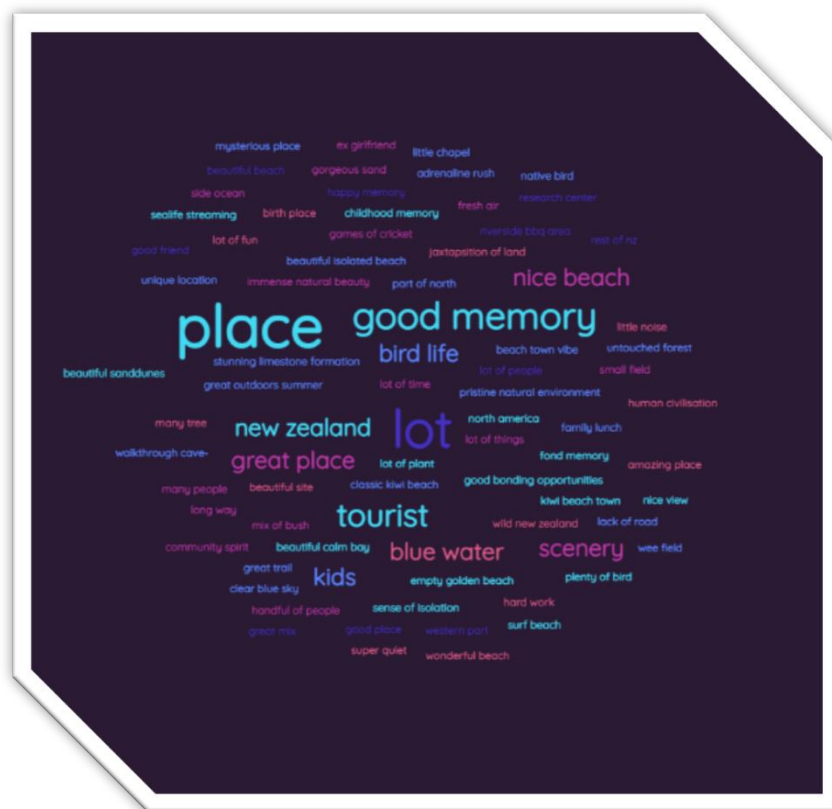
Word Cloud of Nouns, Activities (Monkey Learn, n.d.)



4.4.3 Descriptions

At 52 locations, people provided descriptions of their favourite place. Descriptions are places people described but did not mention any activity they themselves engaged in. Lai et al. (2019), described descriptions as a geometric measurement of place that has boundaries. In this study, extracting adjectives was conducted to find out the descriptive terms people use as they described their favourite place, and while this did not provide a spatial measurement, it did provide an idea of why people liked their favourite place. Descriptions are important since Korpela (1992) asserted that there are still many unknowns about favourite places such as their reasons for going to those places, their experiences while at those places and how it affected their overall happiness (see Section 2.2.7).

These comments by 114 respondents were in answer to Question 1 of the online survey form. Descriptive words are adjectives. Adjectives are defined as describing the object named with a quality (Merriam-Webster, n.d.). Their comments were processed through the POS tagger tool, and the adjectives (descriptions) were extracted. To visualize these descriptions, a word cloud in Figure 54 was generated from their text comments to question 2 using the MonkeyLearn (n.d.) word cloud generator.



4.4.3.1 *AntConc a Transparent Concordance*

AntConc is a concordance created by Laurence Anthony (The Grammar Lab, n.d.). A common method of conducting a corpus analysis would be to compare one corpus with another corpus (The Grammar Lab, n.d.). Comparisons are created from words commonly found in one text compared to another text. Firstly, the “My Favourite Place” corpus file of 52 descriptive locations would need to be uploaded as a text file, and then a “reference corpus” will also need to be uploaded. The reference corpus was obtained from COCA (Corpus of Contemporary American English, n.d.). Then the “coca-samples-sources”⁴ folder was downloaded from the internet, and the contents were extracted from its “source.txt” file which was then uploaded into the “Keyword list” tab found in the AntConc software. In this way, keywords could now be identified by identifying words commonly found within both texts (the reference corpus and the MFP corpus). That is how a reference corpus essentially creates a keyword list.

There was a total of 181 words that was calculated in the “Descriptions” list and the highest ranked word (that is, the most frequent keyword) used in this corpus was “beautiful”, 13 times with a keyness of +92.64 and an effect of 0.0369. The second most frequent keyword was “memories”, 9 times with a keyness of +78.72 and an effect of 0.0259.

4.4.3.2 *Findings for Descriptions of 52 Locations*

Findings for descriptions of 52 locations are:

- The most frequently used word as having the most keyness of +92.64 was the descriptive word “beautiful”.
- The second most frequently used word as having a keyness of +78.72 and an effect of 0.0259 was the word “memories”.

⁴ For more information of the source text at https://www.english-corpora.org/coca/files/coca_2019_12.zip

- Third most frequent word was the word “beach” with a keyness of +70.58 and an effect of 0.0312.

In the word cloud in Figure 54, descriptive words were based on 52 locations where people did not mention an activity they engaged in, but as to how they described the place about its surroundings or things one could do there.

4.4.3.3 *Descriptions of 114 Locations*

Using AntConc, the comments made about 114 locations were uploaded into AntConc and the following findings were made:

- The second most frequently used word, “beautiful” was found 30 times with a keyness value of +157.88 and an effect of 0.0234.
- The third most frequently used word, “beach” had a keyness value of +136.3 and an effect of 0.0218.

In general, the comments made by respondents were their expressions and stories of their favourite places in New Zealand. They are valuable pieces of information that can help various scientific disciplines in the platial sciences, such as environmental psychology, sense of place, applied geography, and including geoinformatics. The word cloud in Figure 55 shows some of the comments and descriptions people used in the online survey.

Figure 55

Word cloud of Comments, 114 Respondents (Monkey Learn, n.d.)



4.4.4 A Geospatial Interpretation of a Cluster Map

The purpose of generating maps, POS tags, keywords and word clouds helps identify locations, activities and descriptions of favourite places. However, how can these methods help in this study? In answer, the methods used in Sections 4.4.1 to 4.4.3 enables the profiling of favourite places so that the author can interpret those favourite places geospatially. For example, one way to interpret places geospatially is through cluster analysis. Guerrero et al. (2016), used as part of their spatial analyses, the city centre and the distance of images near and around the city center. They found hot spots to reveal clusters and used a radius of 400 meters from within the

city centre. Their findings showed that images of the city will come from those within the city rather than outside the city, since people have an affinity for central parks and having accessibility to a place. Similarly, a simple geospatial analysis was used in the study to interpret favourite places in New Zealand.

4.4.4.1.1 Cluster Analysis in the Tasman, Nelson-Blenheim, West Coast and Wellington Regions

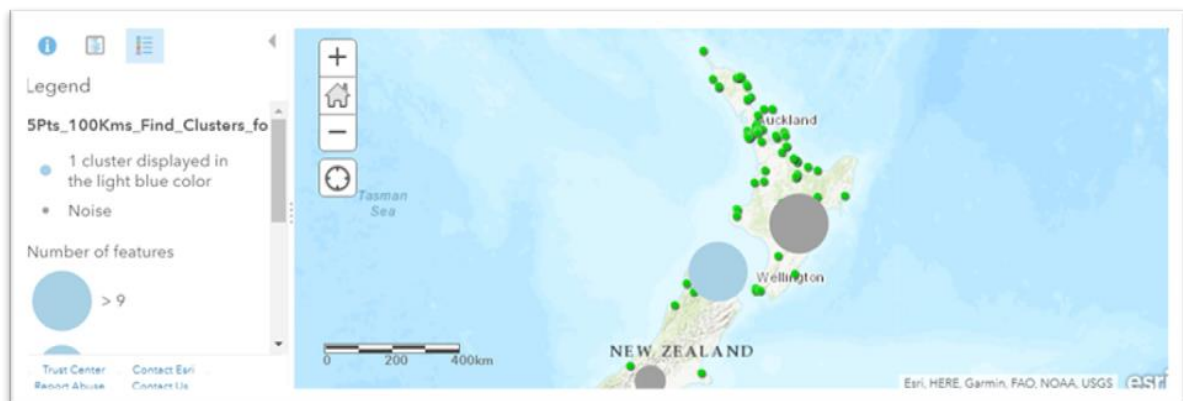
Cluster analysis involves finding dense points of locations through spatially clustering observations of events (Slocum, 2020). Clustering in ArcGIS is ideally for data points of up to 50,000 (Bell, 2018). However, a cluster analysis would still be useful for this study, even though the points of locations submitted were few. A search query was made through ArcGIS Online using the “Find Point Clusters” algorithm (Slocum, 2020) for 114 locations. There were two algorithms chosen, a distance range of 100 kilometres (kms) and a minimum of 5 points. The reason for choosing 5 points was to find places that were further away within a reasonable distance rather than closer to each other. For example, choosing a minimum of 2 points within a range of distance of 100 kms would create many clusters. Particularly in urban cities, 2 points minimum would create predictable clusters because 2 points would be any 2 points on a map. Since this would not be an option for the analysis, choosing 5 points within 100 kms meant that places could be found with less prediction and with a wider scope of discovery.

As part of the “Find Point Clusters” algorithm, ArcGIS would detect points, based on the nearest point A to the nearest point B, and would consider those 2 points as being a cluster. In this case, a query using online ArcGIS was performed to locate a minimum of 5 points within a specified distance. Specifying the distance of 100 kilometres restricted points. Once the parameters were set, one cluster in Figure 56 appeared in the light blue colour of 5 points within a parameter of 100 kms (see Figure 56). ArcGIS detected 21 features (locations) within this cluster. However, the calculations detected 3 locations (totalling 21 features) in the Taranaki

Region of the North Island which was not part of this cluster. ArcGIS removed these same three Taranaki locations and referred to these 3 points as “Noise” as indicated by the grey circles.

Figure 56

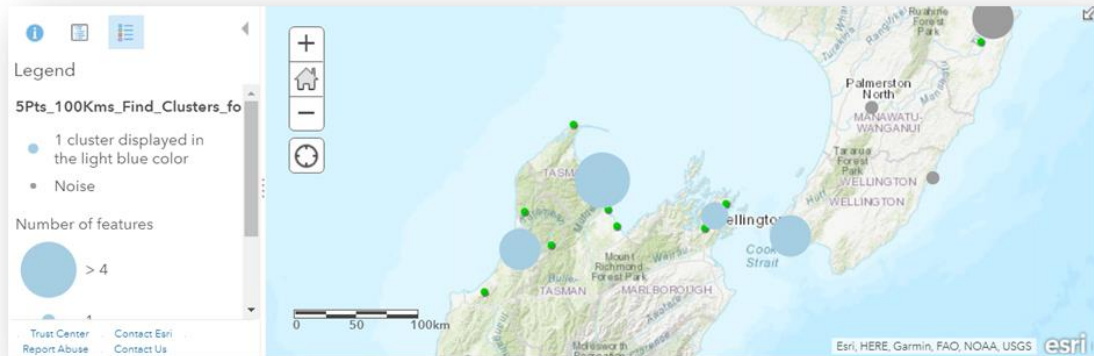
Cluster Map of Favourite Places (ArcGIS Online, n.d.)



Once zoomed in, the cluster breaks into four smaller clusters as Figure 57 shows. There were 18 features in this one cluster, covering a range from the South Island in the Marlborough Region (2 locations), Tasman Region (11 locations) and the West Coast Region (3 locations), to the lower North Island, Wellington (2 locations).

Figure 57

Four smaller clusters (ArcGIS Online, n.d.)



A geospatial interpretation can now be made. Using two algorithms of distance and point clusters in ArcGIS Online, a cluster was found. This cluster was detected based on a minimum of 5 points and a distance of 100 kilometres. The algorithm, after removing outliers, found 18 locations (features) that made up one cluster. A manual count was conducted showing that there were 16 different activities at 10 locations with 20 occurrences of people engaging in a form of activity which are listed below as follows:

- 15% enjoyed walking
- 10% were on holiday
- 10% went to the beach

Other activities found was going to the café, a forest, swimming, walking, restaurants, wine tasting, catching a ferry, beach, bike trail, on a family holiday, sand, making friends and visiting family, and many other activities.

The descriptions for 18 locations was uploaded into AntConc showing that the second highest ranked word was “beautiful” with a frequency of 5 times, a keyness of +32.14 and an effect of 0.0179. The third highest ranked word was “family” with a keyness of +26.44 and an

effect of 0.0208 with keyword frequently. Of the 18 locations, 10 locations were engaging in activities. In Figure 58, four word clouds were generated for each cluster. The word cloud generated by Monkey Learn (n.d.), showed words such as “family holiday”, “beach”, “fishing” in the Tasman region, “podocarp forest” in Wellington, “backcountry” and “outdoors” in the West Coast region, and “walking”, “son”, “family bach” in the Nelson Region.

The word cloud shows, in the case of the one cluster, that people visited a number of favourite places within an 100 kms range in these regions and engaged in walking, were on holiday and went to the beach. The descriptions in their comments reveal that people described these locations as “beautiful” and had spent time there with “family”. Also, since there was 18 features within a rather long distance range, it reveals that respondents’ favourite places were within a range of several points because of its location, what they were doing there and who they were with. Therefore, favourite places are beautiful. They provide opportunities for people to engage in outdoor activities, to enjoy its natural surroundings, and to spend time with family, whether as returning visitors or as residents from a different region, or city across New Zealand.

Figure 58

A Geospatial Interpretation of Locations, Activities, Descriptions (ArcGIS Online, n.d.)



4.5 Answering Three Remaining Research Questions

The results of Surveys Two and Three helps answer 3 remaining research questions:

2. *How are some aspects of sense of place correlated with other aspects (positively or negatively)?*

There were five moderate positive correlations between five place values, showing that their correlations were similar to each other, with linear data points in the same direction, and both variables closer to 1 and further away from zero. The correlated place values were attached, identify, dependence, memorable, wildlife, ecological, and spiritual. Two variables, attached and identify, had correlations with more than one other value.

The seven place values above were not ranked within the top four values of agreement. But instead were values ranked in the middle part of the 16 place values, or nearer to the least preferred place values of disagreement. The correlations found showed that respondents viewed these seven variables similarly to others and showed that while they were still important values for favourite places, they were much closer to each other and would be more or less be the same as the other.

Most of the values were uncorrelated with 20 of them as negatives. This number was low given that most of the values were positive numbers. Two examples considered was the attractive value compared to the intrinsic value. While both values were amongst the two highest out of 16 place values, both values were uncorrelated to each other. The point difference between the two was 0.623 points. The attractive value's average Likert mean was 6.658, which was 1.508 points above the average Likert mean score and had no correlations with the other place values, indicating that people's ratings on the attractive value was very high and stood out as the most important reason why those places were favourite to them.

Correlations between values exists when there are a similar views from the general population who feel similarly like others on some, or quite a lot, of sense of place values.

Negative uncorrelated data between values show that if the general population view a certain value as less important than there will be no correlations to any other value. There will be a few outstanding values that the population will find to be the most outstanding and there may not necessarily be correlations between highly ranked values, since there were no correlations found within the top four values and their data points were dissimilar to each other. Also, noteworthy, was the PCA analysis showing two place values as being separate to the nature cluster and the people cluster. For example, the economic value showed that people did not find agreement in the economic value, including the (NZ) identity value, suggesting that people will feel an emotion to place values arising from how they view the place, and how the place makes them feel as a person. The 7-point Likert scale also demonstrated that the people-to-places relationship is very much described through this measurement tool and that people rate according to values, similar to each other, at least, according to how the place makes them feel as a person, or how the person feels about place.

3. How are particular places in NZ valued for particular aspects?

Some sense of place aspects can be viewed as very important to them if their favourite place is attractive or if their favourite place holds their own value and deserves a right to be there. Or, if their favourite place is safe, and offers recreational outdoor activities then these places will be viewed by people with high importance. Also, the economic value was less agreeable than other values because people did not feel that the economic value of a place affected them as a person, nor the way people they felt about that place.

Also, a geospatial analysis could provide an answer for question 3. For example, a spatial cluster analysis was conducted to find out which regions would show a high density of favourite places. In the cluster point analysis, ArcGIS detected a high density of points from a minimum of 5 points, and within an 100 kilometres range in the top part of the South Island stretching across to Wellington. The observation of events show that within this cluster, a lot

of activities took place, and people had visited locations particularly in the Tasman Region. As a result of the distance algorithm of 100 kilometres, ArcGIS also detected locations in the West Coast Region, Nelson Region and Wellington areas.

The cluster showed the events taking place at those locations, such as their activities, and their descriptions of place in those areas within each other per 100 kilometres. This shows that those areas are popular, offers a lot of activities to people and visitors, and is described as beautiful, peaceful and captivating. The cluster analysis highlighted that people visited places, coastlines, and tourist attractions that offered lots of activities which they could visit within an 100 kms range.

Finally, the review of place values across 15 regions revealed that the average Likert mean for places in Northland was the highest compared to the other 14 regions. However, findings also showed that there were five regions who had a place value with an average mean of 7. The five regions were Canterbury, Marlborough, West Coast, Taranaki and Manawatu whose highest average mean of 7 was found in the attractive place value. West Coast also had an average mean of 7 for liking their favourite place based on its cognitive value.

4. Why are some aspects of sense of place more strongly attached to certain places than others?

Some aspects of sense of place, such as an attractive location, was seen as more important than the genealogy or economic value. These values were measured on a 7-point Likert scale asking respondents to rate their agreement or disagreement on 16 different values. Based on these measurements and the responses, people liked their favourite place more because it was attractive, offered recreational activities or because of the wildlife it offered. The less preferred value was the economic value, showing that people like values that means something to them, what it offers them, and how these places fill their conative, affective, or cognitive needs as earlier discussed in Section 2.3.1.

Also, a review of the activities from 63 respondents showed that 18% of people enjoyed some form of walking activity and had the highest number of people who engaged in this activity. The second highest form of activity was going to the beach, which had 11% of people who engaged in this form of activity. Interesting too, was that 7% of people's favourite place was a place they had spent the holidays there. The third highest form of activity was bird watching and going to an island. People liked these activities because of enjoying the surroundings, or feeling closer to God. People described their favourite place as "stunning", "gorgeous", "peaceful", "gizzy", or "undisturbed", which were words generated from the adjectives.

People's descriptions of their favourite place also revealed why some sense of place aspects are more attached to certain places. For example, people's comments in the word cloud generated from the nouns found descriptive words such as "family", "memory", "children", "dog", "essays", "feeling", or "kauri". People's use of nouns showed that attachment to favourite places included other people, animals, emotions and objects. This highlights the importance of favourite places to people and why certain places are preferred more than others.

5 Discussion

The study of favourite places in New Zealand is new. To my knowledge, there does not exist a journal paper that discusses a wide scope of favourite places across New Zealand, to the extent that this thesis does. Also, there does not appear to be any other web application that collects favourite places from the New Zealand public internet domain, other than the existing “My Favourite Place” web application, that was built by the author and co-authored by the peer supervisor, Dr. Kristin Stock. This study is novel and the findings found in Surveys Two and Three are exciting and new. Favourite places in the context of geoinformatics is untouched territory, and much of this information and research is ongoing.

While the study of sense of place can at times be regarded by some as a social science subject, the subject is also relevant in the study of geoinformatics. In the study of geoinformatics, researchers combined geography and technology to advance the research activities in the platial sciences or geographical information sciences. In the study, the author applied the “My Favourite Place” web application to finding favourite places within New Zealand and Wales. At the same time, the chosen topic of favourite places brought to light many exciting points about sense of place values, what, and where are people’s favourite places, and why. The reasons are varied and insightful, placing importance on the need for spaces and places.

There were also some interesting points that can be made for a future study on favourite places. Firstly, a favourite place needs to be classified correctly. For example, this study did not classify the locations because correct classifications of environments can be detailed and specific, often requiring an extensive search of environmental details such as knowing the sea level, the percentage of plants within a certain area of forest space, precipitation levels, or the population of an urban area. There was some consideration of classifying favourite places in this study using the Millennium Framework, a framework that classifies up to ten different eco-

systems (Alcamo & Bennett, 2003). This framework, however is quite detailed, specifying how the researcher needs to classify environments correctly. Such as, classifying marine environments according to the depth of sea level, below the sea mean level, or in the case of classifying forests according to the percentage of plants in a forest area. This would be ideal, since many of the locations in the study appear to be along the coastline, and yet classifications of these locations would help confirm these observations even more.

Secondly, understanding people's comments and descriptions of their favourite place requires an in-depth study of topic modelling, keyword extraction, or even to include a sentimental analysis. While a corpus was created for "My Favourite Place", the data set is small and requires more years yet to accumulate a larger data set. Also, a study of topics, words, keywords and word vectors would broaden the understanding of favourite places more. Thirdly, a geospatial analysis could be covered a lot more, as data points accumulate, in which case, a cluster analysis of lots of locations would help find spatial patterns. While, the study is the first of building a web application for finding favourite places, and sits on the Massey University url website, furthering research in the areas of topic modelling, geospatial clustering, and land and sea classifications of locations, would be a good research area to explore. Since, the study is ongoing, a direction into those research topics would be recommended for future study. Finally, plans to publish a journal from the findings of Surveys Two and Three has been discussed between the peer supervisor and the author. This makes way for exciting months ahead to continue researching and contributing towards the scientific community of our findings on favourite places in New Zealand.

6 Conclusion

In conclusion, the need for favourite places are based on people's need to spend time with family, children, friends, or to go on holiday, play with sand, connect with God, relax, find peace, connect with ancestors, take photos of birds, play competitive sport, enjoy good food, wine, and even coffee! People who responded to the survey (114 in New Zealand and 14 from Wales totalling 128 respondents), helped this study understand favourite places in a new way.

The contribution of this study is many, exciting, and exhaustive. The findings in the context of favourite places is novel, and fills some gaps in favourite places research, or sense of place research. Korpela et al. (2020) asserted that there are still gaps as to reasons why people go to favourite places. This study asserts that some of those reasons includes the types of activities they engage in and the descriptions of those places. Conducting random sampling on nine smaller sets showed correlations, and place values that are preferred across age groups, genders and countries. Key findings in this study was:

- Aesthetic, scenic value had the highest average Likert mean score across all 16 place values for all ages, and genders for people in New Zealand and in Wales.
- Correlations exists between place values, age groups, genders, and the two countries of New Zealand and Wales. For example, there was a strong positive correlation of 0.9227 between males and females, between 20 to 29 year olds with 50 to 59 year olds at 0.89, between 40 to 49 year olds and 50 to 59 year olds at 0.965665, and between Wales and the entire New Zealand data set at 0.79 who viewed the overall 16 place statements with an agreement of 5.
- Locations identified for their overall high average mean of 5.708 for 16 place values (and when compared to other regions) was the Northland Region, compared to the other 14 regions. Respondents whose favourite places were located in the Canterbury,

Marlborough, West Coast, Taranaki and Manawatu Regions had the highest mean of 7 for the attractive value (and including the cognitive value for West Coast).

- Activities at 62 locations (within the 114 entire data set) showed that 18% enjoyed walking and 11% liked going to the beach. At 10 locations (the cluster set) showed that 15% enjoyed walking and 10% liked going to the beach as well as 10% were on holiday there.
- Descriptions such as the word “beautiful” was mentioned the most out of 114 locations with a keyness of +157.88 and an effect of 0.0234. The word “beautiful” was also ranked second for 52 locations (within the 114 entire data set) with a keyness of +92.64.

Much of this work is significant and new. The study explored favourite places in New Zealand and Wales in a new way. This was achieved by the following methods:

- Collecting a comprehensive set of 16 place statements measured on a 7-point Likert scale resulting in an average Likert mean score of 5 points, producing a normal distribution of results. This meant that the type of place statements chosen, and the number of statements selected, provided respondents more opportunities for agreement and disagreement.
- Also using a 7-point Likert scale to measure place values provided much interpolation to find the balance between agreement and disagreement.
- Using the “My Favourite Place” web application to find favourite places in New Zealand and Wales was an effective instrument for a wider reach of people.
- The text boxes in the online survey form provided reasons for people to tell why it is their favourite place.
- A new corpus for “My Favourite Place” was created and its corpora will continue to increase.

- The T-distribution model was an appropriate method to understand the data set.
- The high frequency count of the keyword “beautiful” in AntConc, demonstrated how often people described their favourite places, which also mirrored the highest average Likert mean score of the scenic, attractive value, 16 values.

This study also contributed towards the scientific community in many ways as listed below:

- Favourite places for adults were located in New Zealand and Wales.
- The study defined the scope for this study to respondents from the ages of 18 years and older.
- This study collected raw data from the public domain through use of the “My Favourite Place” web application which was designed and built for this study.
- Place selection of favourite places widened the boundaries to include places within the geographic boundaries of the country of New Zealand, and Wales.
- Place selection was chosen by respondents with a scope of any place in New Zealand or Wales.
- Data collected contained real locations, coordinates, stories and memories of favourite places from adults.
- A geospatial interpretation of locations, activities and descriptions were provided through a cluster analysis, a concordance, POS tagger tool and word clouds.
- Findings provided detailed reasons why people liked favourite places.
- Approaching the crowds on the public internet domain to complete the online survey was a successful method to collect unbiased and well-dispersed data distribution.
- The “My Favourite Place” web application is a fully functional web application and has academic potential for exploratory research in place-based research in the favourite places-led context, which is largely “untouched”.

- Choosing 16 place statements that is agreeable or disagreeable for quality and quantity of responses was a successful strategy for balanced data integrity.
- The normal distribution model is a suitable model for this type of study.

Other Findings in this Study

- The quality of responses for VGI activities, such as counting objects on maps still needs improvement.
- Text colour that is hard or easy to read is dependent on visual impairment.
- Preference for an interface is a colourful interface.
- The average Likert mean score of 5 points across all 16 values will provide an indication of how people value a favourite place.
- Women tend to measure favourite places more positively than men.
- There are strong correlations between sample 4 of 40 to 49 year olds of New Zealand, and Wales with an R-value of 0.849868506.
- The PCA plot graph revealed two clusters of people and nature, showing peoples view of place and the relationships that exists between people and place.

In the study, the importance of the places-to-people and people-to-places relationships cannot be overlooked. The survival of the natural environment is dependent on these relationships. Changes to the natural physical landscapes can affect the welfare of people. Therefore, key stakeholders, policymakers and local government must ensure that the natural environment is managed properly and constructively, and that urban development and planning is conducted with a consideration for people's need for spaces and places to rest, rejuvenate, and enjoy their surroundings with loved ones, friends, and other people. Also, people's view on wildlife,

marine life, plant life, animals and bird life also demonstrates the importance of managing healthy eco-systems in order to flourish, preserve life and maintain human existence.

Favourite places are special places. The people who shared their stories in this study are some of their most precious memories they have lived in their lives. Their views on place and space helps researchers in the topic area of sense of place, environmental management, applied geography, or even geoinformatics and user interface design, consider finding novel and exploratory ways of understanding people's view of favourite places, so that the natural environment might live on as a clean and safe environment.

7 Materials and Methods

Primary and secondary literature were sought covering several disciplines of Environmental Psychology, Tourism Management, Health & Place, Urban Forestry & Urban Greening, Geography, Children's Geographies, American Journal of Preventive Medicine and Nordic Psychology.

Literature search was conducted through keywords and keyword combinations of favourite places, sense of place, tourism, user interface design and colour, user interface design, gamification, gamification and crowdsourcing, VGI crowdsourcing, crowdsourcing, VGI and maps, motivation, and place attachment. Literature was sought for their frameworks, methods, from both empirical and theoretical studies.

The literature review was both systematic and traditional, writing narratives of the journals selected, and using an Excel spreadsheet to store the literature review data. The summary included a numbering system, numbering the collection of literature, the file date, author, title, topic, what is known, what is not known, areas of controversy, significance of the research question and how it relates to the research topic. Questions were formulated to assess whether further research was required, to ascertain the main findings and to make conclusions.

Areas of agreement and disagreement between authors and research points were highlighted to find appropriate tensions, research gaps, and opportunities for analysis and creation of new points. Articles chosen were topics most relevant to the study, and recording the literature review formed part of building a knowledge-base which helped establish a platform for this study.

Literature discussed was selected to highlight people's preference for favourite places, the different perspectives and choices of favourite places between adults, adolescents and children, the places-to-people relationships, and how these approaches of place identity, place dependence, and place attachment are part of peoples descriptions of favourite places. Our

study is empirical research based on observation of people's responses to our survey, and an analysis of the measurement of our 7-point Likert scale. The primary data collected for our study was gathered from people who responded to our online survey observed in the real world forum, and our secondary data from our literature review provided a theoretical background of our study.

Primary literature: favourite places, sense of place, tourism, user interface design, place attachment and VGI, crowdsourcing

Secondary literature: gamification, and motivation

Disciplines:

1. Sense of Place
2. Environmental Psychology
3. Tourism Management
4. Health and Place
5. Urban Forestry and Urban Greening
6. Children's Geographies
7. American Journal of Preventive Medicine
8. Nordic Psychology
9. Applied Geography
10. Arctic Anthropology

8 Bibliography

- Adams, B., & McKenzie, G. (2013). Inferring thematic places from spatially referenced natural language descriptions. In D. Sui, S. Elwood, & M. Goodchild (Eds.), *Crowdsourcing geographic knowledge: Volunteered geographic information (vgi) in theory and practice* (pp. 201–221). Springer, Netherlands.
Doi:10.1007/978- 94- 007- 4587- 2_12
- Agafonkin, V. (n.d.). *Leaflet*. Retrieved from <https://leafletjs.com/>. Accessed on 21 February 2021.
- Ahmouda, A., Hochmair, H. H., & Cvetojevic, S. (2018). Analyzing the effect of earthquakes on open street map contribution patterns and tweeting activities. *Geospatial Information Science*, 21(3), 195–212. Doi:10.1080/10095020.2018.1498666
- Alcamo, J., Bennett, E. M., & (Program), M. E. A. (2003). Ecosystems and human well-being: A framework for assessment. Millenium Ecosystem Assessment. Island Press.
Retrieved from <https://www.millenniumassessment.org/documents/document.48.aspx.pdf>. Accessed on 19 January 2021.
- Allan, Kirkpatrick & Henry. (17 March 2016). *Accessibility Requirements for People with Low Vision*. Retrieved from <https://www.w3.org/TR/low-vision-needs/#cause-and-progression-of-low-vision>. Accessed on 9 December 2020.

Antona, M., Savidis, A., & Stephanidis, C. (2006). A Process-Oriented Interactive Design Environment for Automatic User-Interface Adaption. *International Journal of Human-Computer Interaction*, 20(2), 79-116. Doi:10.1207/s15327590ijhc2002_2

Azizul, M. F., Knight-Lenihan, S., & van Roon, M. (2016). Sense Shaping Place: Repositioning the Role of Sense of Place in Social-Ecological Systems from a Bioregional Planning Viewpoint. *IAFOR Journal of Sustainability, Energy & the Environment*, 3(1). Doi:10.22492/ijsee.3.1.02

Baez, M.C., Mosquera, J.J.M., & Stobäus, C.D. (2017). Initial Motivation and Pedagogical Support of Physical Education Students of Unipampa-RS. *Creative Education*, 8(9), 1401-1414. Doi:10.4236/ce.2017.89098

Bahrehdar, A. R., & Purves, R. S. (2018). Description and characterization of place properties using topic modelling on georeferenced tags. *Geospatial Information Science*, 21(3), 173-184. Doi:10.1080/10095020.2018.1493238

Bayas, J., See, L., Fritz, S., Sturn, T., Perger, C, Dürauer, M., Karner, M., Moorthy, I., Schepaschenko, D., Domain, D., & McCallum, I. (2016). Crowdsourcing in-situ data on land cover and land use using gamification and mobile technology. *Remote Sensing*, 8(11). Doi:10.3390/rs8110905

Beischer, A., Cochrane, L., Corbett, J., Evans, M., Gill, M., & Millard, E. (2015). Mapping experiences of injustice: developing a crowdsourced mapping tool for

documenting good practices for overcoming social exclusion. Paper presented at the Spatial Knowledge and Information Conference at Banff.

Bell, J. (November 2018). *Learn to Use Clustering in ArcGIS Online*. Retrieved from <https://www.esri.com/about/newsroom/arcwatch/learn-to-use-clustering-in-arcgis-online/>. Accessed on 14 February 2021.

Bellizzi, J., & Hite, R. (1992). Environmental color, consumer feelings, and purchase likelihood. *Psychology & Marketing*, 9(5), 347-363. Doi:10.1002/mar.4220090502

Bhutkar, G., Ray, G., Katre, D., & Deshmukh, S. (2011). Long-distance visibility testing of visual alerts in medical user interfaces in ICU, *IIT*, 296. Chennai.

Blaison, C. & Hess, U. (2016). Affective judgement in spatial context: How places derive affective meaning from their surroundings. *Journal of Environmental Psychology*. 47, 53-65. Doi:10.1016/j.jenvp.2016.05.005

Brown, C. (2017). 'Favourite places in school' for lower set 'ability' pupils: School groupings practices and children's spatial orientations." *Children's Geographies*, 15(4), 399-412. Doi:10.1080/14733285.2016.1269154

Brown, G., & Brabyn, L. (2012). An analysis of the relationships between multiple values and physical landscapes at a regional scale using public participation gis and landscape character classification. *Landscape and Urban Planning*, 107(3), 317–331. Doi:10.1016/j.landurbplan.2012.06.007

- Brown, G. & Raymond, C. (2007). The relationship between place attachment and landscape values: Toward mapping place attachment. *Applied Geography* 27(2), 89-111. Doi:10.1016/j.apgeog.2006.11.002
- Brown, G. & Weber, D. (2012). A place-based approach to conservation management using public participation GIS (PPGIS). *Journal of Environmental Planning and Management*, 1(19).
- Brown, M., Sharples, S., & Harding, J. (2013). Introducing PEGI: A usability process for the practical evaluation of Geographic information. *International Journal of Human-Computer Studies*, 71(6), 668-678. Doi:10.1016/j.ijhcs.2013.01.004
- Chang, W., & Lin, H. (2010). The Impact of color traits on corporate branding. *African Journal of Business Management*, 4(15), 3344-3355. Doi:10.5897/AJBM.9000586
- Cheng, F., Wu, C., & Leiner, B. (2019). The influence of user interface design on consumer perceptions: A cross-cultural comparison. *Institute of Technology Management. Computers in Human Behavior*, 101, 394-401.
- Corpus of Contemporary American English. (n.d.). *Corpus of Contemporary American English*. Retrieved September 16, 2020, from https://www.english-corpora.org/coca/files/coca_2019_12.zip
- COVID-19. (n.d.). *Alert system overview*. Retrieved from

<https://covid19.govt.nz/alert-system/alert-system-overview/>. Accessed on 11 October 2020.

Curry, T., Croitoru, A., Crooks, A., & Stefanidis, A. (2019). Exodus 2.0: crowdsourcing geographical and social trails of mass migration. *Journal of Geographic Systems*, 21, 161-187. Doi:10.1007/s10109-018-0278-1

Davidtmiller. (Nov 4, 2020). *Bootstrap 4.5.3 and dependencies update*. Retrieved from <https://github.com/StartBootstrap/startbootstrap-modern-business/commit/dbcde3e40713c1cd1183a691918beecc2a075fe2>. Accessed on 4 December 2020.

Duff, C. (2012). Exploring the role of ‘enabling places’ in promoting recovery from mental illness: A qualitative test of a relational model. *Health & Place*, 18(6), 1388–1395.

Dykes, R., Stock, K., & Medyckyj-Scott, D. (2018). Supplementary 4: A Review of Environmental Crowdsourcing Literature. *Landcare Research. The National Land Resource Centre, Landcare Research New Zealand Ltd.*

Encyclopaedia Britannica, Inc. (n.d.). *Wales*. Retrieved from <https://www.britannica.com/place/Wales/The-20th-century>. Accessed 7 February 2021.

- Engler, M. (1990). Experience at view places: An inquiry into the emotional ties between people and places. (R. I. Selby, K. H. Anthony, J. Choi & B. Orland, Eds.). Paper presented at the Coming of Age Proceedings of the 21st Annual Conference of the Environmental Design Research Association, Oklahoma City: EDRA. pp. 222-230.
- Erdiaw-Kwasie, M. O., & Basson, M. (2018). Reimagining socio-spatial planning: Towards a synthesis between sense of place and social sustainability approaches. *Planning Theory*, 17(4)514-532. Doi:10.1177/1473095217736793
- Evans, C., & Sabry, K. (2003). Evaluation of the Interactivity of Web-Based Learning Systems: Principles and Process. *Innovations in Education and Teaching International*, 40(1), 89-99. Doi:10.1080/1355800032000038787
- Finnerty, A., Kucherbaev, P., Tranquillini, S., & Convertino, G. (2013). Keep it simple: Reward and task design in crowdsourcing. Paper presented at the *Proceedings of the Biannual Conference of the Italian Section of SIGCHI (CHIItaly '13)*. Association for Computing Machinery, New York, NY, USA, Article 14, 1-4.
Doi:10.1145/2499149.2499168
- Finstad, K. (2010). Response Interpolation and Scale Sensitivity: Evidence Against 5-Point Scales. 5. *Journal of Usability Studies*, 5(3), 104-110.
- Frey, B. S., & Jegen, R. (2001). Motivation Crowding theory: A survey of empirical evidence. *Journal of Economic Surveys*, 15(5), 589 - 611.
Doi:10.1111/1467-6419.00150

- Galliano, S.J., & Loeffler, G.M. (1999). *Place assessment: how people define ecosystems*. (T. M. Quigley, Ed.; tech. rep.). U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Portland, Oregon.
- Garett, J. J. (2011). *The Elements of User Experience*. (2nd ed.). Berkeley, California: New Riders.
- Gatersleben, B., & Andrews, M. (2012). When walking in nature is not restorative – The role of prospect and refuge. *Health & Place*, 20, 91-101.
Doi:10.1016/j.healthplace.2013.01.001
- Gómez-Barrón, J., Manso-Callejo, M.Á., Alcarria, R., & Iturrioz, T. (2016). Volunteered Geographic Information System Design: Project and Participation Guidelines. *ISPRS International Journal of Geo-Information*, 5(7). Doi:10.3390/ijgi5070108
- Gray, S., Milton, R., & Hudson-Smith, A. (2015). Advances in Crowdsourcing: Surveys, social media, and geospatial analysis: Towards a big data toolkit. Section 13. In Garrigos-Simon, F.J., Gil-Pechuán, I., Estelles-Miguel, S. (Eds), *Advances in crowdsourcing* (pp. 163–179). Springer, Cham. Doi:10.1007/978-3-319-18341-1_13
- Guerrero, P., Møller, M.S., Olafsson, A.S., & Snizek, B. (2016). Revealing cultural ecosystem services through Instagram images: The potential of social media volunteered geographic information for urban green infrastructure planning and governance. *Urban Planning*, 1(2), 1-17.

- Gunawardhana, T. (2017). *Re: How can I convert different point Likert scales for all questionnaires in a survey?* Retrieved from:
https://www.researchgate.net/post/How_can_I_convert_different_point_Likert_scales_for_all_questionnaires_in_a_survey/591c52d8b0366daef5267aa9/citation/download.
 Accessed on the 23rd of November 2020.
- Gupta, S., Pebesma, E., Degbelo, A., Costa, A. (2018). Optimising citizen-driven air quality monitoring networks for cities. *International Journal of Geo-Information*, 7(12). Doi:10.3390/ijgi7120468
- Hall, C., & Mitchell, I., & Keelan, N. (1992). Māori culture and heritage tourism in New Zealand. *Journal of Cultural Geography*. 12(2), 115-128.
 Doi:10.1080/08873639209478414.
- Haworth, B., & Whittaker, J., & Bruce, E. (2016). Assessing the application and value of participatory mapping for community bushfire preparation. *Applied Geography*, 76, 115-127. Doi:10.1016/j.apgeog.2016.09.019
- Hossain, M. (2012). *Users' Motivation to Participate in Online Crowdsourcing Platforms*. Paper presented at the 2012 International Conference on Innovation, Management and Technology Research (ICIMTR2012), Malacca, Malaysia : 21-22 May 2012.
- Hostinger. (n.d.). *Next Generation Tech*. Retrieved from
<https://www.hostinger.com/technology>. Accessed on 4 December 2020.

Jayapandian, M. (2009). *Automated creation of database forms* (Doctoral dissertation). The University of Michigan.

Jenkins, A., Croitoru, A., Crooks, A.T., & Stefanidis, A., (2016). Crowdsourcing a Collective Sense of Place. *PloS one* 11(4). Doi:10.1371/journal.pone.0152932

Johnsen, S. Å. K. (2013). Exploring the use of nature for emotion regulation: Associations with personality, perceived stress, and restorative outcomes. *Nordic Psychology*, 65(4), 306–321. Doi:10.1080/19012276.2013.851445

Johnson, D., Deterding, S., Kuhn, K-A., Staneva, A., Stoyanov, S., & Hides, L. (2016). Gamification for health and wellbeing: A systematic review of the literature. *Internet Interventions*, 6, 89-106.

Jorgensen, B.S., & Stedman, R.C. (2001). Sense of Place as an Attitude: Lakeshore Owners Attitudes Toward their Properties. *Journal of Environmental Psychology*, 21(3), 233-248. Doi:10.1006/jevp.2001.0226

Jorgensen, B. & Stedman, R. (2006). A comparative analysis of predictors of sense of place dimensions: Attachment to, dependence on, and identification with lakeshore properties. *Journal of Environmental Management*, 79(3), 316-327.
Doi:10.1016/j.jenvman.2005.08.003

- Jurdak, R., Zhao, K., Liu, J., AbouJaoude, M., Cameron, M., & Newth, D. (2015). Understanding Human Mobility from Twitter (Y. Wu, Ed). *PLoS One*, 10(1).
Doi:10.1371/journal.pone.0131469
- Kantola, S., Uusitaloa, M., Nivala, V., & Tuulentie, S. (2018). Tourism resort users' participation in planning: Testing the public participation geographic information system method in Levi, Finnish Lapland. *Tourism Management Perspectives*, 27, 22-32. Doi:10.1016/j.tmp.2018.04.001
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework [Green Psychology]. *Journal of Environmental Psychology*, 15(3), 169-182.
Doi:10.1016/0272-4944(95)90001-2
- Kim, S. (2012). Audience involvement and film tourism experiences: Emotional places, emotional experiences. *Tourism Management*, 33(2), 387-396.
Doi:10.1016/j.tourman.2011.04.008
- Korpela, K. M. (1992). Adolescents' favourite places and environmental self-regulation. *Journal of Environmental Psychology*, 12(3), 249-258.
Doi:10.1016/j.amepre.2009.01.022
- Korpela, K., Korhonen, M., Nummi, T., Martos, T., & Sallay, V. (2020). Environmental self-regulation in favourite places of Finnish and Hungarian adults. *Journal of Environmental Psychology*, 67, 101384. Doi:10.1016/j.jenvp.2019.101384

- Korpela, K. M., & Ylén, M. P. (2009). Effectiveness of Favorite-Place Prescriptions
A Field Experiment. *American Journal of Preventive Medicine*, 36(5).
- Kyle, G., & Graefe, A., & Manning, R. (2003). Satisfaction Derived through Leisure
Involvement and Setting Attachment. *Leisure/Loisir*, 28(3-4), 277-305.
Doi:10.1080/14927713.2003.9651316
- Kyle, G., Graefe, A., Manning, R., & Bacon, J. (2004). Effect of activity involvement and
place attachment on recreationists' perceptions of setting density. *Journal of Leisure
Research*, 36(2), 209-231. Doi:10.1080/00222216.2004.11950020
- Lab, T. G. (n.d). *AntConc walk-through*. Retrieved from
<http://www.thegrammarlab.com/?nor-portfolio=antconc-walk-through>. Accessed on
19 February 2021.
- Lai, L., Lansley, G., Haworth, J., & Cheng, T. (2019). A name-led approach to profile urban
places based on geotagged Twitter data. *GIS*, 24(4), 858-879.
Doi:10.1111/tgis.12599
- Langley, S., Messina, J., & Moore, N. (2017). Using meta-quality to assess the utility of
volunteered geographic information for science. *International Journal of Health
Geographics*, 16(40). Doi:10.1186/s12942-017-0113-9

- Lechner, A., Owen, J. & Ang, M. & Kemp, D. (2019). Spatially Integrated Social Sciences with Qualitative GIS to Support Impact Assessment in Mining Communities. *Resources*, 8(1). Doi:10.3390/resources8010047
- Lecompte, A. & Trelohan, M., Gentric, M., & Aquilina, M. (2017). Putting sense of place at the centre of place brand development. 1-21. *Journal of Marketing Management*, 33(5-6), 400-420. Doi:10.1080/0267257X.2017.1307872
- Low, S. M. & Altman, I. (1992). Place attachment: A conceptual inquiry. In *Human behaviour and environment advances in theory and research. Place attachment*. New York: Plenum Press.
- MacMillan Dictionary. (2009-2020). Evaluator. In *MacMillan Education Limited*.
<https://www.macmillandictionary.com/dictionary/british/evaluator>
- Magee, L., Handmer, J., Neale, T., & Ladds, M. (2016). Locating the intangible: Integrating a sense of place into cost estimations of natural disasters. *Geoforum*, 77, 61-72.
Doi:10.1016/j.geoforum.2016.09.018
- Manzo, L.C. (2003). Beyond house and haven: toward a revisioning of emotional relationships with places. *Journal of Environmental Psychology*, 23(1), 47-61.
Doi:10.1016/S0272-4944(02)00074-9
- McGraw, K. O. (1978). The detrimental effects of reward on performance: A literature review and a prediction model. In D. G. Mark R. Lepper (Ed.), *The hidden*

costs of reward: New perspectives on the psychology of human motivation (1st ed., pp. 33–60). Psychology Press. Doi:10.4324/9781315666983

Measuring U. (n.d.). *5 Ways to Interpret a SUS Score*. Retrieved from <https://measuringu.com/interpret-sus-score/>. Accessed on 23 November 2020.

Merriam-Webster. (n.d.). *Adjective*. Retrieved from <https://www.merriam-webster.com/dictionary/adjective>. Accessed on 19 February 2021.

Meyers-Levy, J., & Peracchio, L.A. (1995). Understanding the Effects of Color: How the Correspondence between Available and Required Resources Affects Attitudes. *Journal of Consumer Research*, 22(2), 121-138. Doi: 10.1086/209440

Microsoft. (n.d.). *A flexible & easy-to-manager web server*. Retrieved from <https://www.iis.net/>. Accessed on Saturday the 6th of December 2020.

Milligan, C., & Bingley, A. (2006). Restorative places or scary places? The impact of woodland on the mental well-being of young adults. *Health & Place*, 13(4), 799-811. Doi:10.1016/j.healthplace.2007.01.005

MIT. (2016). *Reading 11: Experiment Design*. 6.813/831 User Interface Design & Implementation. Retrieved from <http://web.mit.edu/6.813/www/sp16/classes/11-experiment-design/>

- MonkeyLearn. (n.d.). *Word Cloud Generator*. Retrieved from <https://monkeylearn.com/word-cloud/>. Accessed on 18th of November 2020.
- Morschheuser, B., Hamari, J., Koivisto, J., & Maedche, A. (2017). Gamified Crowdsourcing: Conceptualization, literature review, and future agenda. *International Journal of Human-Computer Studies*, 106, 26-43. Doi:10.1016/j.ijhcs.2017.04.005
- Nielsen, J. (2000). “*Why You Only Need to Test with 5 Users.*” Retrieved from <https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/>
- Nielsen, J. (2005). *Ten Usability Heuristics*. Retrieved from <https://www.informaticathomas.nl/heuristicsNielsen.pdf>
- O’Brien, H.L., Arguellob, J., & Capra, R. (2020). An empirical study of interest, task complexity, and search behaviour on user engagement. *Information Processing & Management*, 57(3), 102226. Doi:10.1016/j.ipm.2020.102226
- Park, K. S., & Lim, C.H. (1999). A structured methodology for comparative evaluation of user interface designs using usability criteria and measures. *International Journal of Industrial Ergonomics*, 23(5), 379-389.
- Parts-of-speech. Info. (n.d.). *Parts of Speech Info*. Retrieved from <https://parts-of-speech.info/>. Accessed on the 8th of January 2021.
- Perry A., Wilson D. (2003). *Before the Brand: Creating the Unique*

DNA of an enduring Brand Identity. McGraw-Hill.

Preece, J., Rogers, Y., & Sharpe, H. (2015). *Interaction Design: Beyond Human Computer*. (4th ed.). Chichester, West Sussex, United Kingdom: John Wiley & Sons Ltd.

Proshansky, H. M. (1978). The city and self-identity. *Environment and Behavior*, 10(2), 147–169. Doi:10.1177/0013916578102002

Qualtrics. (2020). *Customer Survey Software*. Retrieved from <https://www.qualtrics.com/au/customer-experience/surveys/>

Rasmussen, K. (2004). Places for Children – Children’s Places. *Children*, 11(2), 155–173. Doi:10.1177/0907568204043053

Relph, E. (1976). *Place and Placelessness*. London: Pion Limited.

Riechers, M., Henkel, W., Engbers, M., & Fischer, J. (2019). Stories of Favourite Places in Public Spaces: Emotional Responses to Landscape Change. *Sustainability*, 11(14). Doi:/10.3390/su11143851

Rioux, L., Werner, C., Mokoukolo, R., & Brown, B. (2016). Walking in two French neighbourhoods: A study of how park numbers and locations relate to everyday walking. *Journal of Environmental Psychology*, 48, 169-184. Doi:10.1016/j.jenvp.2016.10.003

- Rollero, C., & De Piccoli, N. (2010). Place attachment, identification and environment perception: An empirical study. *Journal of Environmental Psychology*, 30(2), 198-205. Doi:10.1016/j.jenvp.2009.12.003
- Sampson, K. & Goodrich, C. (2005). 'We're Coasters, why should we move?' Community identity, place attachment and forestry closure in rural New Zealand. *Sites: a journal of social anthropology and cultural studies*, 2(1), 124-149.
Doi:10.11157/sites-vol2iss1id55
- Sampson, K. A. & Goodrich, C. G. (2009). Making Place: Identity Construction and Community Formation through "Sense of Place" in Westland, New Zealand. *Society & Natural Resources*, 22(10), 901-915.
Doi:10.1080/08941920802178172
- Sauro, J. (August 25, 2010). *Should you use 5 or 7 Point Scales?* Retrieved from <https://measuringu.com/scale-points/>. Accessed on 23rd of November 2020.
- Sauro, J. (September 19, 2018). *5 Ways to Interpret a SUS Score*. Retrieved from <https://measuringu.com/interpret-sus-score/>. Accessed on 14th of February 2021.
- Senaratne, H., Mobasheri, A., Ali, A. L., Capineri, C., & Haklay, M. (2016). A review of volunteered geographic information quality assessment methods. *International Journal of Geographical Information Science*, 31(1).
Doi:10.1080/13658816.2016.1189556

- Shaykh-Baygloo, R. (2021). Foreign tourists' experience: The tri-partite relationships among sense of place toward destination city, tourism attractions and tourist' overall satisfaction – Evidence from Shiraz, Iran. *Journal of Destination Marketing & Management*, 19, 100518. Doi:10.1016/j.jdmm.2020.100518
- Sigala, M. (2015). Gamification for Crowdsourcing Marketing Practices: Applications and Benefits in Tourism. In: Garrigos-Simon, F., Gil-Pechuán, I., Estelles-Miguel, S. (eds). *Advances in Crowdsourcing*. Springer International Publishing. Doi:10.1007/978-3-319-18341-1_11
- Sik-Lányi, C. (2012). Choosing effective colours for websites. In *Color design* (pp. 600-621). Doi:10.1533/9780857095534.4.600
- Sime, J. D. (1995). Creating places or designing spaces? *Journal of Environmental Psychology*, 6,(1), 49-63. Doi:10.1016/S0272-4944(86)80034-2
- Slocum, N. (2020, March 16). *Discover Spatiotemporal Clusters of Events with GeoAnalytics*. Retrieved from <https://www.esri.com/arcgis-blog/products/geoanalytics-server/analytics/discover-spatiotemporal-clusters-of-events-with-geoAnalytics/>. Accessed on 16th of February 2021.
- Smith, S. (2015). A sense of place: place, culture and tourism. *Tourism Recreation Research*, 40(2), 220–233. Doi:10.1080/02508281.2015.1049814

- Statistics for Wales. (2020, May 20). *Summary statistics for Wales, by region: 2020*. Retrieved from <https://gov.wales/sites/default/files/statistics-and-research/2020-05/summary-statistics-regions-wales-2020-629.pdf>. Accessed on the 7th of February 2021.
- Stedman, R. (2002). Toward a Social Psychology of Place: Predicting Behaviour from Place-Based Cognitions, Attitude, and Identity. *Environment and Behavior*, 34(5), 561-581. Doi:10.1177/0013916502034005001
- Stephenson, J. (2008). The Cultural Values Model: An integrated approach to values in landscapes. *Landscape and urban planning*, 84(2), 127-130. Doi:10.1016/j.landurbplan.2007.07.003
- Svensson, G. (2016). Do You Have Any Particular Favourite Place? Hunters' and Anglers' Secrets Meet Tourism in Northern Norway. *Arctic Anthropology*, 53(1), 58-68.
- Swann, Jr., W. B. (1983). Self-Verification: Bringing social reality into harmony with the self. In J. M. Suls & A. G. Greenwald (Eds.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Swasty, W., & Adriyanto, A.R. (2017). Does colour matter on web user interface design? *Communication & Information Technology Journal*, 11(1), 17-24.
- The Cornell Laboratory of Ornithology. (2018). *Merlin*. Retrieved from <https://merlin.allaboutbirds.org/>

Tractinsky, N., Katz, A., & Ikar, D. (2000). What is beautiful. *Interacting with Computers*, 13(2), 127-145. Doi:10.1016/S0953-5438(00)00031-X

Tuan, Y.F. (1977). *Space and Place – The Perspective of Experience*. London : Edward Arnold (Publishers) Ltd. Minneapolis : University of Minnesota Press.

Tzavella, K., Fekete, A., & Fiedrich, F. (2018). Opportunities provided by geographic information systems and volunteered geographic information for a timely emergency response during flood events in Cologne, Germany. *Natural Hazards*, 91(1), 29-57. Doi:10.1007/s11069-017-3102-1

Uniform. (n.d.). *Uniform Server: A lightweight mobile wamp server solution*. Retrieved from <https://www.uniformserver.com/>. Accessed from Sunday 6th of December 2020.

Wilkie, S., & Stavridou, A. (2013). Influence of environmental preference and environment type congruence on judgements of restorative potential. *Urban Forestry & Urban Greening*, 12(2), 163–170. Doi:10.1016/j.ufug.2013.01.004

Xi, N., & Hamari, J. (2019). Does gamification satisfy needs? A study on the relationship between gamification features and intrinsic need satisfaction. *International Journal of Information Management*, 46, 210-221. Doi:10.1016/j.ijinfomgt.2018.12.002

- Yang, F., & Shen, F. (2019). Involvement without Knowledge Gain: A Meta-Analysis of the Cognitive Effects of Website Interactivity. *Journal of Broadcasting & Electronic Media*, 63(2), 211-230. Doi:10.1080/08838151.2019.1622341
- Yushiana, M., & Rani, W.A., (2007). Heuristic evaluation of interface usability for a web-based OPAC. (Schmetzke, A. & Greifeneder, E., Eds.). *Library Hi Tech*, 25(4), 538-549. Doi:10.1108/07378830710840491
- Zhou, C., Su, F., Pei, T., Zhang, A., Du, Y, Luo, B., Cao, Z., Wang, J., Yuan, Y., Zhu, Y., Song, C., Chen, J., Xu, J., Li, F., Ma, T., Jiang, L., Yan, F., Yi, J., Hu, Y., Liao, Y. & Xiao, H. (2020). COVID-19: Challenges to GIS with Big Data. *Geography and Sustainability*, 1(1), 77-87. Doi:10.1016/j.geosus.2020.03.005

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10 Appendices

10.1 Appendix A


My Favourite Place NZ Website.

Figure A 1

Home Page

My Favourite Place 

[Home](#) [About](#) [Contact](#) [Favourites](#) [Link to Wales](#)

ENHANCED BY Google 

Welcome to My Favourite Place

No matter how busy your day is, we know that we need time out to wind down and relax. Maybe those wind down places are at the cafe, the beach, a park or at the wharf. Wherever you end up, we know that your wind down place is probably one of your favourite places.

Our website offers many features to help understand what makes certain locations a favourite place for many people. As part of understanding what makes your favourite place a favourite place, *we would like you to complete **one task*** to help us learn more about people's favourite places:

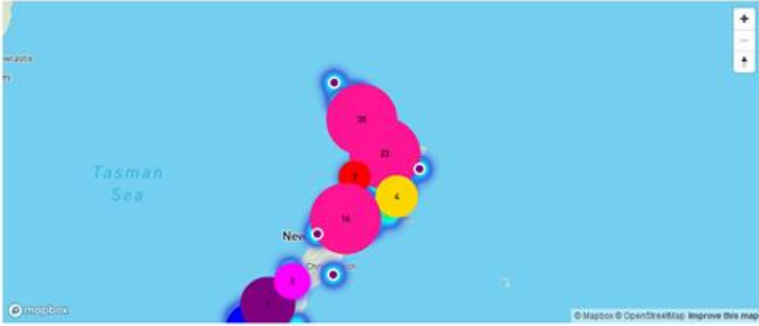
- Complete our "Favourites" form by clicking on the blue button below.

[Add My Favourite Place](#)

Cluster Map

The cluster map below shows people's favourite places in New Zealand. Why not give it a try and check out people's favourite places in the map below?

Please note, however, that we are only providing a glimpse of favourite places submitted by others in the map below. You will only be able to zoom into a certain distance of the map. To see the whole map, which also includes the comments shared by others, you will need to complete the "Favourites" form first. Click [here](#) to complete it.



What happens after I complete the "Favourites" form?

After you have submitted your favourite New Zealand place in the "Favourites" form, you will be directed to a page that provides details of the favourite places submitted by others and their comments about them. We prefer you to tell us about your favourite place before you look at everyone else's, to avoid any risk of bias in your selection.

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Figure A 2

About Page

About Our Research

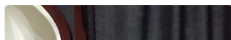
[Home](#) / [About](#)

Who we are

[Dr. Kristin Stock](#) and [Johanna Richardson](#) are researchers from the [Massey Geoinformatics Collaboratory](#) who are interested in finding out what makes certain locations favourite places for people. Favourite places are connected to our identity, our heritage and our view of the world around us.


This project has been evaluated by peer review and judged to be low risk. Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this website are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.



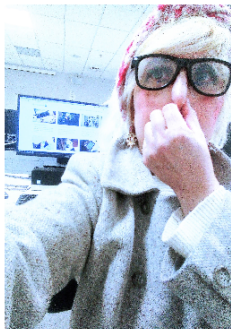
Dr. Kristin Stock

My Favourite Place 

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[View Profile](#)



Johanna Richardson

Research Assistant at [Massey Geoinformatics Collaboratory](#) and a Master's Degree Candidate in Information Sciences at Massey University, my current research is focused on geoinformatics, VGI (Volunteered geographic information), crowdsourcing, user interface design and people's sense of place in the context of our cultural eco-system.

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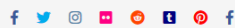


Figure A 3

Favourite Page

My Favourite Place

About Contact Feedback

My Favourite Place Capturing my sense of place

Home / My Favourite Place

What's your favourite place in New Zealand?

Use the map below to tell us the location of your favourite place. Then tell us a bit about yourself, why it's your favourite place and then answer a few questions on why you value that place.

Why are we asking you about your favourite place?

Understanding what makes a certain location a favourite place is an important aspect of how we interact with our natural environment. We are interested in finding out what makes a place provide value and why, to ensure we maintain that environment from natural and constructed management opportunities.

Please note that:

- we are only interested in places in New Zealand in this study and;
- we would like you to be as specific as possible. So, rather than specifying an entire town, region or area, specify which place in that town, region or area is your favourite;
- you must be 18 or over to complete this survey;
- your place must be that you are completing this form, you are consenting to the terms and conditions regarding your participation and data as described [here](#).

Step 1. Tell us the location of your favourite place

Required Fields

To find your favourite place on the map, zoom in or out and move the map. Click on the map when you find your favourite place.

Latitude: Longitude:

What is your favourite place in New Zealand?

Please specify an exact place, rather than an entire town or area.

Why is this your favourite place?

Please write as much information as you can.

Step 2. Some questions on why you value this place

In the statements below, please tell us just how much importance you would place on these personal statements by choosing a point on a scale between 1 to 7. 1 being "Completely Disagree" through to 7 as "Completely Agree".

Personal Statement	1 Entirely Disagree	2 Mostly Disagree	3 Somewhat Disagree	4 Neither Agree nor Disagree	5 Somewhat Agree	6 Mostly Agree	7 Entirely Agree
I value these places because they help produce, preserve and restore air, soil and water.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I value these places because they provide a variety of jobs, skills, and income for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I value this place because of its recreational outdoor activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This place is valuable because it is a place where people can connect to past and present experiences, traditions, history or a way of life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I value these places for economic benefits such as tourism, forestry, agriculture, or other commercial activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I identify strongly with this place.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get more satisfaction from visiting this place than any other place.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I value this place because it is spiritually special to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These places are valuable because they are wild, unmodified or otherwise undisturbed by human activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like this place because of my personal past or future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am very attached to this place.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel safe at this place.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This place is valuable because it represents my identity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These places hold their own value and deserve to be seen, no matter what or others think about them, or even if they are actually used.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I value this place for the attraction scenery, sights, sounds, or smells.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like this place because of the stories and myths that are told about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Step 3. Now tell us about yourself

Gender:

☐ Male

☐ Female

☐ Other

Age:

☐ 18 to 29 years

☐ 30 to 39 years

☐ 40 to 49 years

☐ 50 to 59 years

☐ 60 to 69 years

☐ 70 to 79 years

☐ 80 to 89 years

☐ 90 to 99 years

Are you a resident or visitor at this place?

☐ Yes

☐ No

[View selected favourite places](#) [Reset](#)

We note, the statements above originate from various research publications. Please click [here](#) to find the references for these personal statements.

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Contact Page

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Figure A 5

References Page

My Favourite Place 

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References

Personal statements originate from existing academic research publications as listed below:

Brown, G. & Raymond, C. (2007). [The relationship between place attachment and landscape values: toward mapping place attachment](#). *Applied Geography* 27 (2007) 89-111.

Brown, G. & Weber, D. (2012). [A place-based approach to conservation management using public participation GIS \(PPGIS\)](#). *Journal of Environmental Planning and Management* 2012, 1-19, iFirst article.

Stephenson, J. (2008). [The Cultural Values Model: An integrated approach to values in landscapes](#). *Landscape and urban planning*, 84(2), 127-139.

Erdiaw-Kwasie, M. O., & Basson, M. (2017). [Reimagining socio-spatial planning: Towards a synthesis between sense of place and social sustainability approaches](#). *Planning Theory* 2018, Vol 17(4)514-532. DOI: 10.1177/1473095217736793

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





       

Figure A 6

Privacy Page

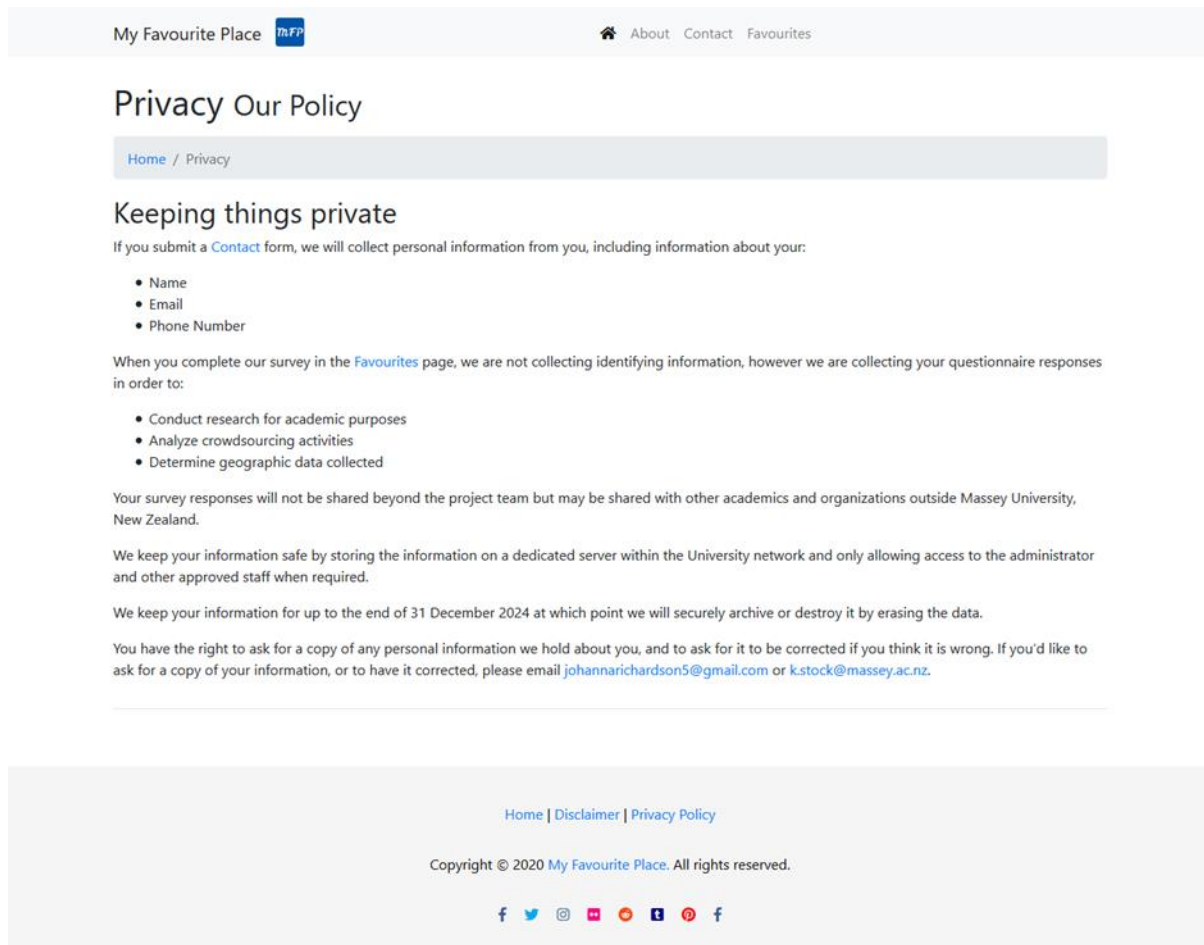




Figure A 7

Disclaimer Page

My Favourite Place 

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10.2 Appendix B

The twelve experimental interfaces used in Survey One.

Figure B 1

Site Map for My Favourite Place Survey One



10.3 Appendix C

Figure C 1

Code script for the table array in the “Favourites” tab

```
<script>

var myTable = ["This place created new memories for me.", "This place has a spiritual aspect to it." , "I liked this place because it is attractive.", "This place is part of my NZ identity.", "This place represents my genealogy.", "I like this place because of the stories and myths that links me to this place." , "I am very attached to this place." , "I identify strongly with this place." , "I value these places because they provide a variety of plants, wildlife, and marine life.", "I get more satisfaction from visiting this place than any other place.", "I like this place because of its recreational outdoor activities.", "These places are valuable because they help produce, preserves and renew air, soil and water.", "I feel safe at this place.", "These areas are valuable because they are wild, uninhabited or relatively untouched by human activity." , "I value these places for economic benefits such as tourism, forestry, agriculture, or other commercial activity." , "These places hold their own value and deserves to be here, no matter what I or others think about them, or even if they are actually used."];

function sortTable() {
  //get the parent table for convenience
  let table = document.getElementById("myTable");

  //1. get all rows
  let rowsCollection = table.querySelectorAll("tr");

  //2. convert to array
  let rows = Array.from(rowsCollection)
    .slice(1); //skip the header row

  //3. shuffle
  shuffleArray(rows);

  //4. add back to the DOM
  for (const row of rows) {
    table.appendChild(row);
  }
}
```

10.4 Appendix D

Figure D 1

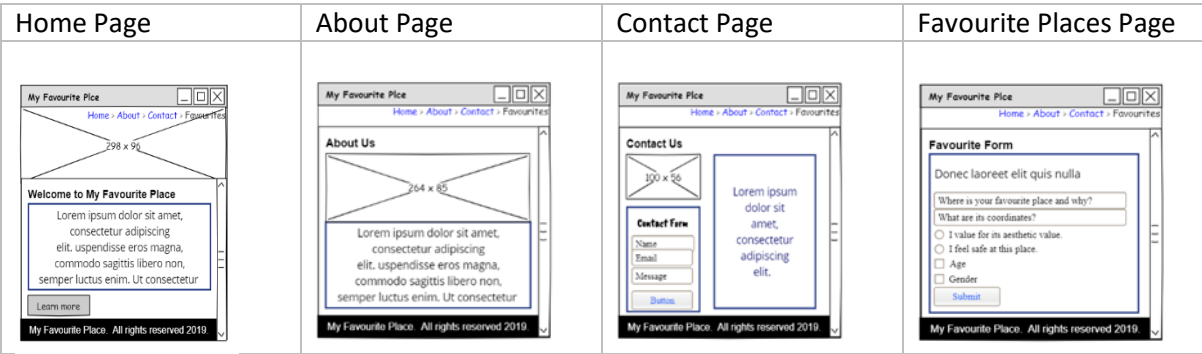
Code script for the Random using the Shuffle function in java script (Stackoverflow, 2019).

```
/**
 * Randomize array element order in-place.
 * Using Durstenfeld shuffle algorithm.
 * from: https://stackoverflow.com/questions/2450954/how-to-randomize-shuffle-
a-javascript-array/12646864#12646864
 */
function shuffleArray(array) {
  for (var i = array.length - 1; i > 0; i--) {
    var j = Math.floor(Math.random() * (i + 1));
    var temp = array[i];
    array[i] = array[j];
    array[j] = temp;
  }
}
```

10.5 Appendix E

Figure E 1

Wireframes for the "My Favourite Place".



10.6 Appendix F

Data⁵ collected from our online survey.

Table below shows 114 responses to the questions: What is your favourite place and why?

⁵ Data in this table has been edited.

Table F 1*Peoples Favourite Places and Why*

What is your favourite place in New Zealand?	Why is this your favourite place?
Castle Point Lighthouse	"End of the world."
Warren Cole walkway, Whakatane Riverbank, near the yacht club.	"I go there to take photos of the birds that live there. Spoonbills, terns stilts, 2 species of Herons etc."
Oneroa Beach, Long Beach Rd., Russell	"Swimming in crystal clear water, picnics under favourite tree, few or no tourists in February or later."
Belt Road, Seaside Holiday Park, New Plymouth	"Trains used to go past there. Handy to sandhills to slide down. Lots of fun!"
Long Beach, Russell, Far North of the North Island	"I remember having a lovely summer at Long Beach, Russell. The ocean tides were fresh coming in from the South Pacific. Very coastal, quiet, and peaceful."
Rotorua city	"Spent the holidays in Rotorua, visiting farmers, shopping and eating at restaurants."
Spirits Bay, Far North	"It is the most beautiful beach in the world and holds many special memories camping with people I love."
The Coromandel Range	"Ancient forest, so good for the soul."
The Port Motueka Marina	"Soothing and relaxing and the place makes you feel great to be alive and living in Motueka and forget about the nastiness in the world. There is an outdoor Cafe; You can sit and have a cup of coffee and a snack and view the blue sea and Blue sky and watch the activity going on around the Marina- family\'s launching small boats to head off fishing or returning from fishing, interesting Yachts arriving from wherever. You have a view of the nearby hills and Mountains some which currently have snow on them. The people are friendly and there is quite often a dog to pat or just watch them being happy. The people using the Cafe mostly retired and happy because of the sunshine and pleasant weather we have. It is also because of what isn't there: you don't see young males with their pants hanging down, that get around in pairs or groups with a surly aggressive attitude with hate on their faces, looking to make trouble. That give you a feeling of uncomfortableness, like elsewhere in N.Z. Port Motueka Marina has a feeling of community, friendliness and well-being. Of being together in Paradise."
Milford Road	"The best scenery, amazing wildlife, awesome walks."
Franz Joseph	"Placed at the foot of the Southern Alps and close to the coast makes Franz Joseph feel like a very special place. Rainforests of wild and beautiful greenery, the trees to the lichen. Some of which are untouched and represent a past era. The glacier itself is a wonder and much can be learned about our climate from the glacial activity. The people are friendly and are fiercely loyal to the West Coast... West Coast, Best Coast. I feel so saddened by the effect of COVID-19. Many are leaving which means when things do come right, there will be some big gaps in the tourist market here in Franz Joseph. There is a quietness

	here and it feels like a place where one can reconnect with Mother Earth, reconnect your soul. We have a rental here and I've been fortunate enough to spend 2 whole weeks here whilst doing some maintenance. I almost feel as if some kind of inner cleanse has happened."
Little Huia	"Its home. Coming home to a beautiful little suburb after work feels amazing. In the weekends we can walk the beach take a hike all in our own back yard"
Orongoronga forest park	"Stunning podocarp forest, beautiful river, close to Wellington."
Tongariro Nat park	"Because of the natural beauty, the desolate nature and the rugged environment"
This bay on Urapukapuka Island	"This is a beautiful calm bay with turquoise blue water over sand. Walking on the island reveals some absolutely beautiful sites and there is plenty of bird life to enjoy. Even in summer there is only a handful of people here and it feels so calm and relaxed."
Beveridge Track, Titirangi	"Lots of memories, some good some not so good. All my children have been through with me and I know the place like the back of my hand. And it's utterly beautiful. Also my son wrote an essay in the track so I know it holds importance to him as well. I actually prefer the secret Watercare track which links to the Slip Track. We're not supposed to walk through there, but it's safe for Kauri and I love it."
Ruakuri Bushwalk	"Great bush walk with a fantastic glow worm display. The rock features are neat too. Good during the day but best at night"
Mount karangahake. To be specific about halfway up going via the easy grade ascension there is a pad	"Climbing the mountain as a young person I always had to stop here to just take it all in"
Wanaka	"Calm, beautiful."
Muriwai	"The sea and waves are nature at its most powerful. Used to tell the kids, over the ocean there is another country. Nothing else between us. Wild, rugged, close to God. Lots of it undisturbed by lots of people."
A spot-on Mt Pirongia	"Outdoor adventure. Challenging. Interesting rocks."
Denniston Plateau	"i love to see all the hard work done by my ancestors and a time when New Zealand was great!"
Ulva Island off Stuart Island	"It feels about as remote as you can get, and has such a spectacular untouched feeling to it. Large birds are friendly and happily wander around you with curiosity."
Piha beach	"I grew up out West and my friends and I would spend a lot of time at Piha. It feels special to me"
Te Mata creek	"Family holiday area, nice water ways, not too far from home."
Matata Straights, BOP	"Pohutukawa's on one side ocean to the other and empty golden beach in between"
The waterhole in Ararimu	"Private and beautiful"
Disappointment island	"You can't grow vegetables in the soil"
Downtown Napier	"Downtown Napier"
Botanical Gardens of Wellington	"Nice view, little noise, lots of plants well-tended for."

Moke Lake, Queenstown, Otago	"Have you seen it?? It's beautiful and I run past it all of the time and it always looks beautiful no matter the weather"
Ruakaka beach	"Beautiful sand dunes, bird life and surf beach"
Tuahine point/Wainui Beach	"Beautiful beach, easily accessible. Nature surrounds, easy gizzy lifestyle, walking track through Tuahine point farm that ends at a cliff on Tuahine point, giving an overhead view of the Tuahine lighthouse."
Little Ngakuta Bay, Queen Charlotte Sound	"We have a family Bach there, since I was 13. My sons now love it too. I enjoy swimming and walking but mainly sitting on the deck."
Tupare garden in New Plymouth	"It's an amazing place, so many trees and flowers with pathways going down to a riverside BBQ area with a small field. It's a great place to go alone to just enjoy the walk through the gardens and maybe along the river, or a good place for a family lunch by the river and a game of cricket or something on the wee field there."
Taylor's mistake	"Good memories"
Te Pukatea Bay	"Beautiful beach with a walkthrough cave- Just stunning"
Lake Pukaki / Mt Cook viewing area	"Beautiful, unique, attracts tourists, memories attached, calm"
Down the back of my family farm	"Super Quiet and Isolated"
Oparara Basin Westcoast	"Remote, nature. Not overrun by tourists. Stunning limestone formations."
Mapua wharf/Rabbit Island	"There is so much to do here. Great fish and chips, restaurants, wine tasting. You can catch the ferry across to Rabbit Island and go to the beach or do a bike trail. On a hot summer's day this is my favourite place to be"
Ocean Beach at Whangarei heads, on a little mountain pillar	"I love the view from up there and I have a lot of good memories I connect to this place"
Kaiteriteri beach	"I had an awesome family holiday there years ago when my kids were small. The weather is warm, the feeling is relaxed. I love the beach and the sand here is nice, the water is relatively warm and the sun usually shines."
The walks on the mountain	"I love the trees, and the sense of nature of these forests"
Hahei, Coromandel	"Gorgeous sand and scenery, still has some of that classic Kiwi beach town vibe, which I find incredibly nostalgic."
Sunflower Motels, Pohara	"I used to have family holidays there, made family friends and visits family. It has beautiful sights, beaches and it's very relaxed"
Queenstown	"A bunch of fun activities to do over there"
Park in Arrowtown	"Good memories as a kid and chill vibe"
Victoria Esplanade	"I used to go there with my ex-girlfriend and I liked the place a lot"
Rotorua lake	"Different from rest of NZ."
Glenorchy	"The scenery is incredible and I have fond memories of visiting here with my parents when they visited."
Takapuna	"Easy accessible and feels good whenever I visit Takapuna beach"

Museum of transport and technology	"The primary reason is to educate and inspire me about transportation technology while also offering delicacies for the eyes. I learned something interesting at the museum that I probably would not have found out otherwise. At the same time, I get to learn in a fun environment."
Auckland	"Lots of things to do and variety"
Owhata harbour	"It is a special spot usually only visited by locals, the environment is very unpolluted and clean, any people met are always friendly and the fishing is great. There is rarely any litter and the scenery is just breath-taking, fresh air is also a big part. Just a place to recharge in a natural setting"
On top of Mt Luna, Kahurangi National Park.	"I love being in the outdoors, especially in the backcountry. This was one of the first places I experienced time in the backcountry surrounded by beech forest and mountains and being able to see all the way to the ocean. It was so peaceful and inspired me to spend more time in the outdoors. It holds a special place in my heart"
This particular beach at Mimiwhangata.	"It has sandy beach, rocky beach, lots of shells, amazing snorkelling, toilets, walks, native birds"
Endeavour Inlet	"Just love the feeling, the lack of roads, and the juxtaposition of land and sea"
Milford Beach	"I visited this place as a child, with my mother and grandmother. I remember spending many sunny summer days there. Now I go back there to walk my dogs, gaze at Rangitoto Island, and see how much the tree that has been there for 40 years has grown."
The Catlin's, Nugget Point	"Beautiful, peaceful, wild New Zealand, not overpopulated by tourists"
Redwoods biking, Rotorua	"Where I learnt to mountain bike."
Totaranui beach in the Abel Tasman National Park.	"Gorgeous beach with perfect golden sand, blue seas, weather in the summer is great. Perfect spot for kayaking and long bush walks."
Papamoa Hill	"Great views, and nice walk up there. Lots of good memories walking there."
Port Fitzroy, Great Barrier Island	"Because it is beautiful and I have very good memories of this place."
Shakespear regional park	"Great place to completely relax"
milford beach walk	"love the fresh air, scenery, openness"
Whiritoa	"It has a research centre ran by my good friend. It has a wonderful beach and not too many people. I do not like people so much, you see."
Mt Ruapehu	"Spent a lot of time here as a child with friends and family, it's absolutely beautiful and a place I learnt a lot about myself, risks, facing fear and the joy of an adrenaline rush."
Flower Pot Lodge, Pitt Island	"Peaceful"
Omapere	"Small, beautiful, peaceful"
Pukawa	"Perfectly located on lake Taupo, lots of water activities, fishing and walks, nice native bush, close to the mountains for walks and skiing, close to hot pools."
Rocks highway, Riverton	"Every family holiday from my childhood"

It is a nice, isolated beach, which you can access from The Sailor Grave.	"We just heard of this place and we just have a feeling of what to look for. So it gave a bit of adventure to find it. That was the first isolated beach, which we visited with almost zero people surrounded by forest. You can see a few islands from the beach, which gives a bit of variety to the view of the ocean, but the waves can still come in and you can body-surf or surf if you wish."
Little Palm Beach, Waiheke Island	"It has a community spirit."
Whatarili beach	"Wild remote and beautiful"
The coastal rocks in front of Bach cafe on the south coast of Wellington between Owiro Bay and Isla	"Stunning views across to the mountains of the south island, peaceful, I can walk there - beautiful waves. A place to sit and just reflect and be grateful. "
Papamoa	"I have fond memories of this place. Often sunny. Nice and quiet. Nice beach."
Tawharanui Regional Park	"Great mix of bush and beach with an array of native birds"
Hauturu Island	"It is one of the most pristine natural environments in NZ"
Mt Luxmore	"Memories of completing the Kepler Track"
Whatipu	"very happy memories"
Wanaka	"Doorstep of the great outdoors summer and winter"
Long bay	"Very nice beach with a great trail to run/walk"
Waitangi	"why because it the birth places of our nation ! and there no other places on earth "
Rangitoto Island	"Good memories and association with personal achievements: 1st visit 30 years ago after a sporting high point, subsequent visits for running, swimming and by canoe. It is also a wild place but in the heart of Auckland -- a place that is important to me."
Queenstown	"Childhood memories. Landscape"
Lake Waikaremoana	"Because it is quiet, and natural, and hard to get to."
Along the Desert Road (Highway 1 near Tongariro National Park)	"I think the scenery is magnificent. Surrounded by desert with the volcanoes to the west, it is spectacular. It also reminds me of my home which is the western part of North America. "
At and around the Church of Good Shepherd in Tekapo	"Most of the time, clear blue skies reflecting on Blue Waters of the lake, Winds, the sense of isolation and the little chapel at the edge of the lake is magical."
Motutara Farm, Whananaki North	"Family camping holidays on the estuary -- many happy memories"
Milford Sound	"It is immense natural beauty "
Mokoia Island in the middle of lake Rotorua	"Memories from childhood. Deep and mysterious place"
Hangdog camp; climbing areas around	"Let me relax, enjoy family time while doing favourite outdoor activities like climbing"
Opinoni. Specifically the camp grounds	"Opinoni is a beautiful place to camp. Mainly because you take a boat ride across the water and you can ride some sand dunes. You may also see some orcas whilst on the boat."
Abel Tasman national park	"Beach, Ocean, rivers, fishing, swimming, kayaking, sailing, forest, birds, walking tracks. "
Queenstown	"So many activities to do, the most beautiful scenery, great cafes, bar and restaurants, so many good walks/hikes"

Fiordland National Park	"So many awesome hiking trails"
Pouakai hut in Egmont national park	"It's a lovely place to have lunch and a great view of mount Egmont."
Mount Cargill, Dunedin	"Beautiful view, good walk to get to the top"
Ruakaka beach	"Spent many happy childhood summers there camping with family and friends. Then took my children there also for summer holidays. Even drive from the south island every summer. Love the long white sandy surf beach and view to Whangarei heads. Not too busy even over Xmas. Both my parents have their ashes there as it was special to them too. It is my turangawaiwai."
Tamatea Peak	"Almost untouched forest and mountain. From the top, you can see for a long way, but cannot see any signs of human civilisation in any direction"
The Bay of Islands, Specifically Waewaetorea Island north side.	"A beautiful, isolated beach with sea life streaming past through the channel."
Mount Maunganui (the Mountain itself)	"This is my favourite place as I lived 3 km from the base for a long time. I would run up it a few times a week. It was not only my training ground but a spiritual place for me. Having the endorphin high when you reach to the top and sitting and looking out at the share beauty from the top is something special. I also used this Mountain as a place to think, unwind and relax in silence."
Redwoods Rotorua	"Peaceful. Beautiful. Therapeutic in all aspects. Close to home. A good bonding opportunity to talk to people and connect"
Ohope	"My grandparents had a beach house at Ohope and we would go over there as often as we could. It holds many memories for me. It's small but not overcrowded like the Mount. Beautiful safe beach. White sand. I continue Togo there as an adult."
Milford Sounds	"It is unspoilt and is a unique location."
Totaranui campsite,	"very beautiful, great walking tracks"
Marakopa	"Peaceful, quiet seaside town hemmed in by native bush and farmland"
In the sea at Whiritoa beach.	"It was the beach I went to every summer growing up. Also it has amazing fun waves."
Mission bay beach	"Because there is a long walkway alongside the beach, there is a nice hill with beautiful scenery and there are cafes and restaurants on the other side of the beach that make this place crowded and alive most of the times."
Mount Manganui	"Hill, see and sand."
Point England	"I am riding bike or spending time at the beach."
Timaru	"Chilliest place you could ever live in."

10.7 Appendix G

Table G 1

Option A Survey Questions in Qualtrics

Option	Section	Interface	Question
Option A	Survey Instruction	6 Interfaces	Q1 - Survey Instruction
Option A	Informed Consent	6 Interfaces	Q2 - Informed Consent
Option A	Protocols	6 Interfaces	Q3 - Protocols
Option A	Introduction	6 Interfaces	Q4 - Introduction
Option A	Socio-Economic	6 Interfaces	Q5 - What is your gender?
Option A	Socio-Economic	6 Interfaces	Q6 - What is your postal code?
Option A	Socio-Economic	6 Interfaces	Q7 - What is your age?
Option A	Section 2	Interface B	Q8 - Section 2: Interface B
Option A	Section 2	Interface B	Q9 - How many pink circles can you see on the map?
Option A	Section 2	Interface B	Q10 - How many blue circles can you see on the map?
Option A	Section 2	Interface B	Q11 - Find a site in the colourful interactive map that you would consider to be a favourite place. Please tell us the name of that favourite place and your reasons why it is special to you.
Option A	Section 2	Interface B	Q12 - Now click on the home page of Interface B. Read the bulleted lines of text. Which colours were hard to read?
Option A	Section 2	Interface B	Q13 - Which colours were easier to read?
Option A	Section 2	Interface B	Q14 - Now that you have seen lines of text in the Home page and the colours in the map, please select which emotion that best describes the way you feel about the various colours and how those colours stimulated you. Tick as many (or all) of your chosen emotion/s for each colour listed below.
Option A	Section 3	Interface C	Q15 - Section 3: Interface C
Option A	Section 3	Interface C	Q16 - Click on the home page. Read the home page. Now tell us 2 two features that the app offers to users.
Option A	Section 3	Interface C	Q17 - While you are still on the home page, please tell us 2 tasks the website is asking you to do.
Option A	Section 3	Interface C	Q18 - Now complete two of those tasks. Did you do complete this?
Option A	Section 3	Interface C	Q19 - Based on your review of Interface C, please describe how it made you feel when you read its content as well as performing two of those tasks.
Option A	Section 3	Interface C	Q20 - Do you think red buttons or black buttons are stimulating?
Option A	Section 3	Interface C	Q21 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?

Option A	Section 3	Interface C	Q22 - For a comparison, would you feel more motivated contributing data on the Interface B website more than the Interface C website?
Option A	Section 3	Interface C	Q23 - Evaluation of Interface B and C
Option A	Section 4	Interface D	Q24 - Section 4: Interface D
Option A	Section 4	Interface D	Q25 - Click on the home page of Interface D, and find the heading title, "Travelling to our favourite places". Watch the video. Please choose one dot in the video. Now, start watching that one dot and tell us how many times that one dot changed colours. Afterwards, please tell us which dot you chose, that is the colour and the icon that was in that dot, and how many times it changed colours. Hint: Take note of the dot's colour and the icon at the end of the video. Write it down as the dot that you watched change colours. Have you completed this?
Option A	Section 4	Interface D	Q26 - While you're still at the home page, please now watch the slides on the carousel which is at the top of the web page. After viewing, please name three places that were displayed in the slide carousel?
Option A	Section 4	Interface D	Q27 - From the home page, click on the box called "Favourite Places". It will direct you to two forms indicated by Part 1 and Part 2. Complete the two forms. Have you completed this?
Option A	Section 4	Interface D	Q28 - At the top of the navigation bar, click on the Activities tab. Tell us up to nine of your favourite places in New Zealand. Have you completed this?
Option A	Section 4	Interface D	Q29 - Form features helps make forms more interactive. Please click on the Favourite Places tab and review the form. Which form features would you prefer using? Tick all that applies.
Option A	Section 4	Interface D	Q30 - Do you think system feedback increases motivation? For example, after you had completed an online form, the system responded back to you saying, "Great! We have received your completed form. Thank you. Have a great day!"
Option A	Section 5	Interface E	Q31 - Section: Interface E
Option A	Section 5	Interface E	Q32 - Imagine that you are interested in becoming a volunteer for the "My Favourite Place" crowdsourcing project. Click on the Contact page and find a way to send us a message for more information about how you can become a volunteer for the "My Favourite Place" project. Did you complete this?
Option A	Section 5	Interface E	Q33 - Can you tell us which features are missing in the Interface E compared to the Interface D? Hint: Review the tabs in the home, contact, favourites, and activities pages. Tick all that apply.
Option A	Section 5	Interface E	Q34 - Do you think that the use of buttons make the user experience more enjoyable such as the Interface D version compared to the Interface E version?

Option A	Section 5	Interface E	Q35 - Evaluation of Interface D and Interface E
Option A	Section 5	Interface E	Q36 - Section 7: Interface G
Option A	Section 7	Interface G	Q37 - Click the home page for the non-visible version and read its content. Please tell us what action is expected from you.
Option A	Section 7	Interface G	Q38 - Did you understand what tasks were required from you after reading the content on the home page?
Option A	Section 7	Interface G	Q39 - Would you have been more motivated to contribute data if you knew exactly what tasks are required from you?
Option A	Section 6	Interface F	Q40 - Section 6: Interface F
Option A	Section 6	Interface F	Q41 - Now click on the home page of Interface F and read its content. After reading its contents, please tell us what the website is asking you to do.
Option A	Section 6	Interface F	Q42 - For the Interface F interface, did the task descriptions in the home page help you perform certain tasks?
Option A	Section 6	Interface F	Q43 - Evaluation of Interface F and Interface G

10.8 Appendix H

Table H 1

Option B Survey Questions in Qualtrics

Option B	Survey Instruction	6 Interfaces	Q1 - Survey Instruction
Option B	Informed Consent	6 Interfaces	Q2 - Informed Consent
Option B	Protocols	6 Interfaces	Q3 - Protocols
Option B	Introduction	6 Interfaces	Q4 - Introduction
Option B	Socio-Economic	6 Interfaces	Q5 - What is your gender?
Option B	Socio-Economic	6 Interfaces	Q6 - What is your postal code?
Option B	Socio-Economic	6 Interfaces	Q7 - What is your age?
Option B	Section 12	Interface L	Q8 - Section 12: Interface L
Option B	Section 12	Interface L	Q9 - How many purple map markers can you see in the pop-up map?
Option B	Section 12	Interface L	Q10 - How many red map markers can you see in the pop-up map?
Option B	Section 12	Interface L	Q11 - How many pop-up icons can you see in the pop-up map? Hint: zoom out and look out for little grey icons.
Option B	Section 12	Interface L	Q12 - How many pop-up markers did you see in the slideshow gallery map?

Option B	Section 12	Interface L	Q13 - In the slideshow gallery map, this map displays icons, pop-up markers, images and a slideshow gallery. Click on the icons, and find a location that has two or more photo slides. Hint: Click on the right and left arrows in each slide to see if there is more than one photo. Please tell us what was the name of this location?
Option B	Section 12	Interface L	Q14 - In the pop-up map, how many map icons can you see? Hint: Zoom in and out to see the little grey icons and click onto them to see the pop-ups!
Option B	Section 12	Interface L	Q15 - In the drag and drop map, find one of your favourite places and tell us the latitude and longitudes. Hint: First, click on the "Zoom to buildings" button to get you to street level. Then, click on the blue map marker and drag in. In the left-hand corner you will see the coordinates. Then write as: "Longitude (coordinates), Latitude (coordinates)".
Option B	Section 12	Interface L	Q16 - Here's a pop-up map. Would you remember the site more if you saw a pop-up icon with a photo of the location rather than remembering the blue marker of that location on the standard map?
Option B	Section 11	Interface K	Q17 - Section 11: Interface K
Option B	Section 11	Interface K	Q18 - We are now going to go on a little tour on the street Interactive map. Locate "Mount Sunday". See sidebar once connected to a different interactive map. Find the nearest town by typing in destination A, "Ashburton Airport, Ashburton, Canterbury", and for B, use your mouse to click on the blue circle. Which town did you find?
Option B	Section 11	Interface K	Q19 - Let's head north now. In the interactive map, use the text boxes up in the top left corner to find destination A to B. In the text box for destination A, type in "22 Albert Street, Auckland Central, Auckland". Now try typing an address for the Statue of Victoria Queen in destination B and tell us which address (or thereabouts) you had entered. Request directions for "Walking". Which address did you use?
Option B	Section 11	Interface K	Q20 - Locate the "Statue of Queen Victoria". See sidebar once connected to the interactive map. Name the nearest point of interest to the statue.
Option B	Section 11	Interface K	Q21 - Where are the pink circles mainly located in NZ?
Option B	Section 11	Interface K	Q22 - In the cluster map, how many clusters can you see?
Option B	Section 11	Interface K	Q23 - How many red circles can you see in the heat map?
Option B	Section 11	Interface K	Q24 - When does the heat map locations turn blue? Hint: Zoom in and out of the map.
Option B	Section 11	Interface K	Q25 - Do you think colour, map markers, pop-up icons, photos and a hover function in maps would motivate you to contribute data?
Option B	Section 11	Interface K	Q26 - Evaluation of Interface K

Option B	Section 1	Interface A	Q27 - Section 1: Interface A
Option B	Section 1	Interface A	Q28 - We will start off by looking at a standard map. How many blue markers can you see on the map?
Option B	Section 1	Interface A	Q29 - Now click on every page and select which feature you liked the most about the standard interface!
Option B	Section 1	Interface A	Q30 - Would you prefer a map that displayed icons, pop-up text boxes or pop-up photos of the location, more than this standard static map?
Option B	Section 8	Interface H	Q31 - Section 8: Interface H
Option B	Section 8	Interface H	Q32 - We are now going to start playing games. To play, you will first need to register an account with Gametize. It only takes a few minutes. Once you have done that. Then click on the home page of the Interface H interface, scroll halfway down and play all three games, which won't take you too long. A second window should appear with the first game. Have you completed this?
Option B	Section 8	Interface H	Q33 - Now go back to the home page of Interface H and go to the first box displayed as Game 1: Answer it! and click on "Play Game", by pressing the Control key and the left side of the mouse at the same time. A second window should appear with the first game. Have you completed this?
Option B	Section 8	Interface H	Q34 - Return to the Interface H and now click on Game 2: Photo Challenge. Have you completed this?
Option B	Section 8	Interface H	Q35 - Return to Interface H and click on the third game. Have you completed this?
Option B	Section 8	Interface H	Q36 - In Gametize, click on the leader board icon, and tell us your points.
Option B	Section 8	Interface H	Q37 - In Gametize, click on the leader board icon and tell us which badges you had won.
Option B	Section 8	Interface H	Q38 - Now that you have played some games, which game elements did you like the most. Tick all that applies.
Option B	Section 8	Interface H	Q39 - Here's a comparison - if you had a choice, which interface do you think would motivate you to contribute data? Would it be the Interface A or the Interface H?
Option B	Section 8	Interface H	Q40 - Did a points-based system motivate you to contribute data?
Option B	Section 8	Interface H	Q41 - Evaluation in Interface A
Option B	Section 9	Interface I	Q42 - Section 9: Interface I
Option B	Section 9	Interface I	Q43 - In the Home page, scroll down and find the first box that says, "Game 1: Answer it!" Before you can play this first game, you will need to register an account with Gametize. Have you completed this?
Option B	Section 9	Interface I	Q44 - Now that you have registered an account with Gametize, go back to the home page of Interface I and go to the first box displayed as "Game 1: Answer it!"

			Click on “Play Game” by pressing the control key and the left side of the mouse at the same time. A second window should appear with the first game. Have you completed this?
Option B	Section 9	Interface I	Q45 - Return to the Interface I interface and now click on Game 2: Photo Challenge. Have you completed this?
Option B	Section 9	Interface I	Q46 - Return to the Interface I interface and click on the third game. Have you completed this?
Option B	Section 9	Interface I	Q47 - In Gametize, click on the leader board icon, and tell us your points.
Option B	Section 9	Interface I	Q48 - In Gametize, click on the leader board icon and tell us all of the badges you received.
Option B	Section 9	Interface I	Q49 - Did you received any awards in Interface I?
Option B	Section 10	Interface J	Q50 - Section 10: Interface J
Option B	Section 10	Interface J	Q51 - In the home page in Interface J, complete Game 1, Game 2 and Game 3. Have you completed this?
Option B	Section 10	Interface J	Q52 - In Gametize, click on the leader board icon, and tell us your points.
Option B	Section 10	Interface J	Q53 - In Gametize, click on the leader board icon and tell us all of the badges you received.
Option B	Section 10	Interface J	Q54 - Did you receive any rewards in Interface J? Hint: Play the games to earn enough points that you can redeem.
Option B	Section 10	Interface J	Q55 - Would receiving rewards motivate you to continue contributing data even more?
Option B	Section 10	Interface J	Q56 - Evaluation of Interface J

10.9 Appendix I

Table I 1

Option C. Survey Questions in Qualtrics.

Option C	Survey Instruction	6 Interfaces	Q1 - Survey Instruction
Option C	Informed Consent	6 Interfaces	Q2 - Informed Consent
Option C	Protocols	6 Interfaces	Q3 - Protocols
Option C	Introduction	6 Interfaces	Q4 - Introduction
Option C	Socio-Economic	6 Interfaces	Q5 - What is your gender?
Option C	Socio-Economic	6 Interfaces	Q6 - What is your postal code?
Option C	Socio-Economic	6 Interfaces	Q7 - What is your age?
Option C	Section 11	Interface K	Q8 - Section 11: Interface K
Option C	Section 11	Interface K	Q9 - We are now going to go on a little tour on the street Interactive map. Locate "Mount Sunday".

			See sidebar once connected to a different interactive map. Find the nearest town by typing in destination A, "Ashburton Airport, Ashburton, Canterbury", and for B, use your mouse to click on the blue circle. Which town did you find?
Option C	Section 11	Interface K	Q10 - Let's head north now. In the interactive map, use the text boxes up in the top left corner to find destination A to B. In the text box for destination A, type in "22 Albert Street, Auckland Central, Auckland". Now try typing an address for the Statue of Victoria Queen in destination B and tell us which address (or thereabouts) you had entered. Request directions for "Walking". Which address did you use?
Option C	Section 11	Interface K	Q11 - Locate the "Statue of Queen Victoria". See sidebar once connected to the interactive map. Name the nearest point of interest to the statue
Option C	Section 11	Interface K	Q12 - Where are the pink circles mainly located in NZ?
Option C	Section 11	Interface K	Q13 - In the cluster map, how many clusters can you see?
Option C	Section 11	Interface K	Q14 - How many red circles can you see in the heat map?
Option C	Section 11	Interface K	Q15 - When does the heat map locations turn blue? Hint: zoom in and out of the map.
Option C	Section 11	Interface K	Q16 - Do you think colour, map markers, pop-up icons, photos and a hover function in maps would motivate you to contribute data?
Option C	Section 11	Interface K	Q17 - Evaluation of Interface K
Option C	Section 2	Interface B	Q18 - Section 2: Interface B
Option C	Section 2	Interface B	Q19 - How many pink circles can you see on the map?
Option C	Section 2	Interface B	Q20 - How many blue circles can you see on the map?
Option C	Section 2	Interface B	Q21 - Find one site in the colourful interactive map that you would consider to be a favourite place. Please tell us the name of that favourite place and your reasons why.
Option C	Section 2	Interface B	Q22 - Now click on the home page of Interface B. Read the bulleted lines of text. Which colours were hard to read?
Option C	Section 2	Interface B	Q23 - Which colours were easier to read?
Option C	Section 2	Interface B	Q24 - Now that you have seen lines of text in the Home page and the colours in the map, please select which emotion that best describes the way you feel about the various colours and how those colours stimulated you. Tick as many (or all) of your chosen emotion/s for each colour listed below.
Option C	Section 2	Interface B	Q25 - Would you feel motivated contributing data on Interface B?

Option C	Section 2	Interface B	Q26 - Would the blue font in the sidebar of Interface B look better than black font?
Option C	Section 2	Interface B	Q27 - Do you think red buttons are stimulating?
Option C	Section 2	Interface B	Q28 - Evaluation of Interface B
Option C	Section 5	Interface E	Q29 - Section 5: Interface E
Option C	Section 5	Interface E	Q30 - Imagine that you are interested in becoming a volunteer for the “My Favourite Place” crowdsourcing project. Click on the Contact page and find a way to send us a message for more information about how you can become a volunteer for the “My Favourite Place” project. Did you complete this?
Option C	Section 5	Interface E	Q31 - Can you tell us which features are missing in Interface E compared to the other interfaces? Hint: Review the home, contact, favourites and activities pages. Tick all that apply.
Option C	Section 5	Interface E	Q32 - Do you think that the use of buttons make the user experience more enjoyable unlike Interface E version?
Option C	Section 5	Interface E	Q33 - Evaluation of Interface E
Option C	Section 6	Interface F	Q34 - Section 6: Interface F
Option C	Section 6	Interface F	Q35 - Now click on the home page of Interface F and read its content. After reading its contents, please tell us what the website is asking you to do.
Option C	Section 6	Interface F	Q36 - For Interface F, did the task descriptions in the home page help you perform certain tasks?
Option C	Section 6	Interface F	Q37 - Evaluation of Interface F
Option C	Section 1	Interface A	Q38 - Section 1: Interface A
Option C	Section 1	Interface A	Q39 - We will start off by looking at a standard map. How many blue markers can you see on the map?
Option C	Section 1	Interface A	Q40 - Now click on every page and select which feature you liked the most about the standard interface!
Option C	Section 1	Interface A	Q41 - Would you prefer a map that displayed icons, pop-up text boxes or pop-up photos of the location, more than the standard static map?
Option C	Section 1	Interface A	Q42 - Evaluation of Interface A
Option C	Section 8	Interface H	Q43 - Section 8: Interface H
Option C	Section 8	Interface H	Q44 - We are now going to start playing games. To play, you will first need to register an account with Gametize. It only takes a few minutes. Once you have done that. Then click on the home page of the Interface H interface, scroll half way down and play all three games, which won't take you too long. A second window should appear with the first game. Have you completed this?
Option C	Section 8	Interface H	Q45 - Now go back to the home page of Interface H and go to the first box displayed as Game 1: Answer it! and click on “Play Game”, by pressing the Control key and the left side of the mouse at the same time.

			A second window should appear with the first game. Have you completed this?
Option C	Section 8	Interface H	Q46 - Return to the Interface H and now click on Game 2: Photo Challenge. Have you completed this?
Option C	Section 8	Interface H	Q47 - Return to Interface H and click on the third game. Have you completed this?
Option C	Section 8	Interface H	Q48 - In Gametize, click on the leader board icon, and tell us your points.
Option C	Section 8	Interface H	Q49 - In Gametize, click on the leader board icon and tell us which badges you had won.
Option C	Section 8	Interface H	Q50 - Now that you have played some games, which game elements did you like the most. Tick all that applies.
Option C	Section 8	Interface H	Q51 - Do you think the gamification elements in Interface H motivate you to submit quality and quantity data?
Option C	Section 8	Interface H	Q52 - Did a points-based system motivate you to contribute data?
Option C	Section 8	Interface H	Q53 - Evaluation of Interface H

10.10 Appendix J

Table J 1

Option D. Survey Questions in Qualtrics.

Option D	Survey Instruction	6 Interfaces	Q1 - Survey Instruction
Option D	Informed Consent	6 Interfaces	Q2 - Informed Consent
Option D	Protocols	6 Interfaces	Q3 - Protocols
Option D	Introduction	6 Interfaces	Q4 - Introduction
Option D	Socio-Economic	6 Interfaces	Q5 - What is your gender?
Option D	Socio-Economic	6 Interfaces	Q6 - What is your postal code?
Option D	Socio-Economic	6 Interfaces	Q7 - What is your age?
Option D	Section 12	Interface L	Q8 - Section 12 - Interface L
Option D	Section 12	Interface L	Q9 - How many purple map markers can you see in the pop-up map?
Option D	Section 12	Interface L	Q10 - How many red map markers can you see in the pop-up map?
Option D	Section 12	Interface L	Q11 - How many pop-up icons can you see in the pop-up map? Hint: Zoom out and look out for little grey icons.
Option D	Section 12	Interface L	Q12 - How many pop-up markers did you see in the slideshow gallery map?
Option D	Section 12	Interface L	Q13 - In the slideshow gallery map this map displays icons, pop-up markers, images and a

			slideshow gallery. Click on the icons and find a location that has two or more photo slides. Hint: Click on the right and left arrows in each slide to see if there is more than one photo. Please tell us what was the name of this location?
Option D	Section 12	Interface L	Q14 - In the pop-up map, how many map icons can you see? Hint: Zoom in and out to see the little grey icons and click onto them to see the pop-ups!
Option D	Section 12	Interface L	Q15 - In the drag and drop map, find one of your favourite places and tell us the latitude and longitudes. Hint: First, click on the "Zoom to buildings" button to get you to street level. Then, click on the blue map marker and drag in. In the left-hand corner you will see the coordinates. Then write as: "Longitude (coordinates), Latitude (coordinates)".
Option D	Section 12	Interface L	Q16 - Here's a pop-up map. Would you remember the site more if you saw a pop-up icon with a photo of the location rather than remembering the blue marker of that location on the standard map?
Option D	Section 12	Interface L	Q17 - Where are the pink circles mainly located in NZ?
Option D	Section 12	Interface L	Q18 - Evaluation of Interface L
Option D	Section 3	Interface C	Q19 - Section 3: Interface C
Option D	Section 3	Interface C	Q20 - Click on the home page. Read the home page. Now tell us 2 two features that the app offers to users.
Option D	Section 3	Interface C	Q21 - While you are still on the home page, please tell us 2 things the website is asking you to do.
Option D	Section 3	Interface C	Q22 - Now complete two of those tasks. Did you do complete this?
Option D	Section 3	Interface C	Q23 - Based on your review of Interface C, please describe how it made you feel when you read its content as well as performing two of those tasks.
Option D	Section 3	Interface C	Q24 - Do you think red buttons or black buttons are stimulating?
Option D	Section 3	Interface C	Q25 - For a comparison, would you feel more motivated contributing data on Interface C website?
Option D	Section 3	Interface C	Q26 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?
Option D	Section 3	Interface C	Q27 - Evaluation of Interface C
Option D	Section 3	Interface D	Q28 - Section 4: Interface D
Option D	Section 3	Interface D	Q29 - Click on the home page of Interface D, and find the heading title, "Travelling to our favourite places". Watch the video. Please choose one dot in the video. Now, start watching that one dot and tell us how many times that one dot changed colours. Have you completed this?

Option D	Section 3	Interface D	Q30 - While you're still at the home page, please now watch the slides on the carousel which is at the top of the web page. Once the carousel (slides) only once. Without looking, name three places that were displayed in the slide carousel?
Option D	Section 3	Interface D	Q31 - From the home page, click on the box called "Favourite Places". It will direct to two forms indicated by Part 1 and Part 2. Complete the two forms. Have you completed this?
Option D	Section 3	Interface D	Q32 - At the top of the navigation bar, click on the Activities tab. Tell us up to nine of your favourite places in New Zealand. Have you completed this?
Option D	Section 3	Interface D	Q33 - Form features helps make forms more interactive. Please click on the Favourite Places table and review the form. Which form features would you prefer using? Tick all that applies.
Option D	Section 3	Interface D	Q34 - Do you think system feedback increases motivation? For example, after you had completed an online form, the system responded back to you saying, "Great! We have received your completed form. Thank you. Have a great day!"
Option D	Section 3	Interface D	Q35 - Evaluation of Interface D
Option D	Section 7	Interface G	Q36 - Section 7: Interface G
Option D	Section 7	Interface G	Q37 - Now click on the home page for the non-visible version and read its content. Please tell us what action is expected from you.
Option D	Section 7	Interface G	Q38 - Did you understand what tasks were required from you after reading the content on the home page?
Option D	Section 7	Interface G	Q39 - Would you have been more motivated to contribute data if you knew exactly what tasks are required from you?
Option D	Section 7	Interface G	Q40 - Evaluation of Interface G
Option D	Section 9	Interface I	Q41 - Section 9: Interface I
Option D	Section 9	Interface I	Q42 - In the Home page, scroll down and find the first box that says, "Game 1: Answer it!" Before you can play this first game, you will need to register an account with Gametize. Have you completed this?
Option D	Section 9	Interface I	Q43 - Return to the Interface I interface and now click on Game 2: Photo Challenge. Have you completed this?
Option D	Section 9	Interface I	Q44 - Now that you have registered an account with Gametize, go back to the home page of Interface I and go to the first box displayed as "Game 1: Answer it!" Click on "Play Game" by pressing the control key and the left side of the mouse at the same time. A second window should appear with the first game. Have you completed this?

Option D	Section 9	Interface I	Q45 - Return to the Interface I interface and click on the third game. Have you completed this?
Option D	Section 9	Interface I	Q46 - In Gametize, click on the leader board icon, and tell us your points.
Option D	Section 9	Interface I	Q47 - In Gametize, click on the leader board icon and tell us all of the badges you received.
Option D	Section 9	Interface I	Q48 - Did you received any awards in Interface I?
Option D	Section 9	Interface I	Q49 - Evaluation of Interface I
Option D	Section 9	Interface A	Q50 - Section 1: Interface A
Option D	Section 9	Interface A	Q51 - We will start off by looking at a standard map. How many blue markers can you see on the map?
Option D	Section 1	Interface A	Q52 - Now click on every page and select which feature you liked the most about the standard interface!
Option D	Section 1	Interface A	Q53 - Would you prefer a map that displayed icons, pop-up text boxes or pop-up photos of the location, more than the standard static map?
Option D	Section 1	Interface A	Q54 - Evaluation of Interface A

10.11 Appendix K

Table K 1

Participant 1

Participant 1 : P1							
Interface	B	C	D	E	F	G	Total
Questions	6	7	6	3	2	3	27
Correct	4	4	6	3			17
Incorrect	2	3				3	8
Evaluation	1		1		1		3 (x 2 = 6)
Completed	1		1				(2)
Skipped					2		2
Socio-Economic							3
All Questions	27 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 33 Questions for Option A						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P1	17 + 3 + 2 = 22 Final score. 22 / 33 = 66.66% or 67% rounded						

Table K 2

Participant 2

Participant 2 : P2

Interface	B	C	D	E	F	G	Total
Questions	6	7	6	3	2	3	27
Correct	4	7	6	3	1	2	23
Incorrect	2					1	3
Evaluation	1		1		1		3 (x 2 = 6)
Completed	1		1				(2)
Skipped					1		1
Socio-Economic							3
All Questions	27 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 33 Questions for Option A						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P2	23 + 3 + 2 = 28 Final score. 28 / 33 = 84.848% or 85% rounded						

Table K 3

Participant 3

Participant 3 : P3							
Interface	K	A	L	H	I	J	Total
Questions	8	3	8	9	7	5	40
Correct	5	2	3	6	5	4	25
Incorrect	3		5				8
Evaluation	1		1		1		3 (x 2 = 6)
Completed	1		1		1		(3)
Skipped		1		3	2	1	7
Socio-Economic							3
All Questions	40 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 46 Questions for Option B						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P3	25 + 3 + 3 = 31 Final score. 31 / 46 = 67.39% or 67% rounded						

Table K 4

Participant 4

Participant 4 : P4							
Interface	K	A	L	H	I	J	Total

Questions	8	3	8	9	7	5	40
Correct	7	3	4	9	7	5	35
Incorrect	1		4				5
Evaluation	1		1		1		3 (x 2 = 6)
Completed	1		1		1		(3)
Skipped							0
Socio-Economic							3
All Questions	40 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 46 Questions for Option B						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P4	35 + 3 + 3 = 36 Final score. 36 / 46 = 78.260% or 78% rounded						

Table K 5

Participant 5

Participant 5 : P5							
Interface	K	A	L	H	I	J	Total
Questions	8	3	8	9	7	5	40
Correct	7	3	3	3	1		17
Incorrect	1		4				5
Evaluation	1		1		1		3 (x 2 = 6)
Completed	1						(1)
Skipped			1	6	6	5	18
Socio-Economic							3
All Questions	40 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 46 Questions for Option B						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P5	17 + 3 + 1 = 21 Final score. 21 / 29 = 72.41% or 72% rounded						
Notes	P5 did not receive an activation link from Gametize and could not answer all questions for interfaces H, I and J. Total questions of H, I and J totalled 21 less four questions answered leaves 17 questions deducted from 46. 46 – 17 = 29 questions.						

Table K 6

Participant 6

Participant 6 : P6							
Interface	F	E	K	B	H	A	Total
Questions	2	3	8	9	9	3	34
Correct			5				5

Incorrect	3					3
Evaluation						3 (x 2 = 6)
Completed	1					(1)
Skipped	2	3		9	9	3
Socio-Economic						3
All Questions	34 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 40 Questions for Option C					
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark					
P6	5 + 3 + 1 = 9 Final score. 9 / 40 = 22.50% or 22% rounded					
Notes	P6 only reviewed 1 out of 6 interfaces and was disqualified from Survey One. The findings for Survey One within this report does not include data from P6.					

Table K 7

Participant 7

Participant 7 : P7							
Interface	F	E	K	B	H	A	Total
Questions	2	3	8	9	9	3	34
Correct	2	3	5	6	7	3	26
Incorrect			3	2			5
Evaluation	1		1		1		3 x 2 = 6
Completed	1		1		1		3
Skipped				1	2		3
Socio-Economic							3
All Questions	34 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 40 Questions for Option C						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P7	34 + 3 + 3 = 40 Final score. 26 / 40 = 65%						
Notes							

Table K 8*Participant 8*

Participant 8 : P8							
Interface	G	D	L	C	I	A	Total
Questions	3	6	9	7	7	3	35
Correct	3	6	4	7	0	3	23
Incorrect			5				5
Evaluation	1		1		1		3 x 2 = 6
Completed	1		1		1		3
Skipped					7		7
Socio-Economic							3
All Questions	35 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 41 Questions for Option D						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P8	23 + 3 + 3 = 29 Final score. 29 / 41 = 70.73% or 71% rounded						
Notes							

Table K 9*Participant 9*

Participant 9 : P9							
Interface	G	D	L	C	I	A	Total
Questions	3	6	9	7	7	3	35
Correct	1	4	4	7	7	0	23
Incorrect	2	2	5				9
Evaluation	1		1		1		3 (x 2 = 6)
Completed	1						
Skipped						3	3
Socio-Economic							3
All Questions	35 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 41 Questions for Option D						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P9	23 + 3 + 1 = 27 Final score. 27 / 35 = 77.14% or 77% rounded						
Notes							

Table K 10*Participant 10.*

Participant 10 : P10							
Interface	G	D	L	C	I	A	Total
Questions	3	6	9	7	7	3	35
Correct	0	4	4	4	0	0	12
Incorrect							0
Evaluation	1		1		1		3 x 2 = 6
Completed	0.50		0.50		0.50		1.5
Skipped	3	2	5	3	7	3	23
Socio-Economic							3
All Questions	35 Interface Questions + 3 Socio-Economic Questions + 3 Evaluations = 41 Questions for Option B						
Total Score	Total Correct + Total Socio-Economic + Total Completed = Final Score. Final score / All Questions = Percentage Final Mark						
P10	12 + 3 + 1.5 = 16.5 Final score. 16.5 / 35 = 47.14% or 47% rounded						
Notes	P10 did not receive an activation link from Gametize and could not answer all questions for interfaces H, I and J. Total questions of H, I and J totalled 21 less four questions answered leaves 17 questions deducted from 46. 46 – 17 = 29 questions						

10.12 Appendix L

Table L 1*“My Favourite Place” Website Build Versions.*

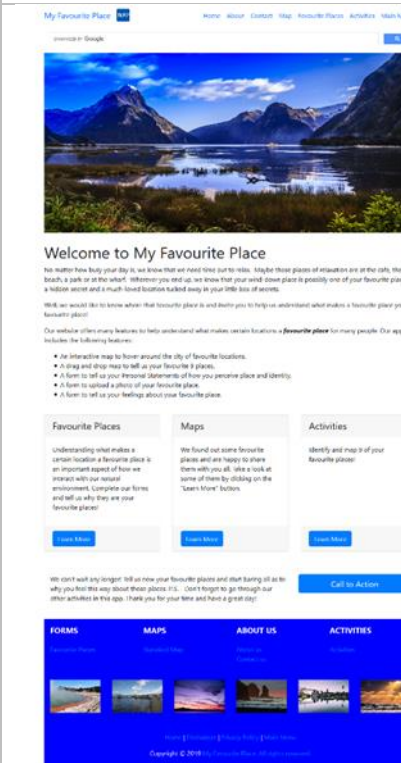
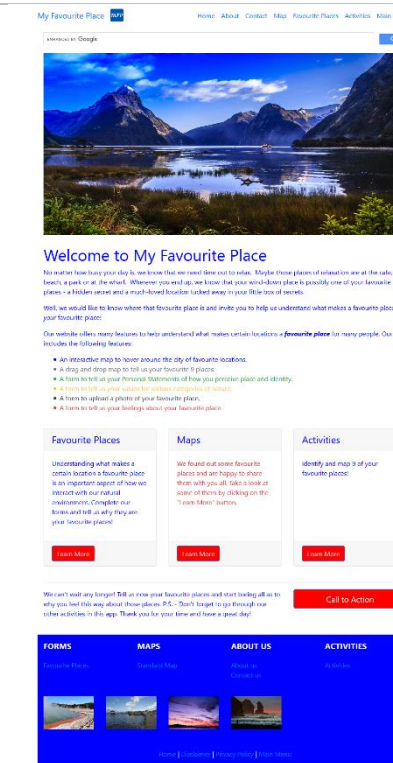
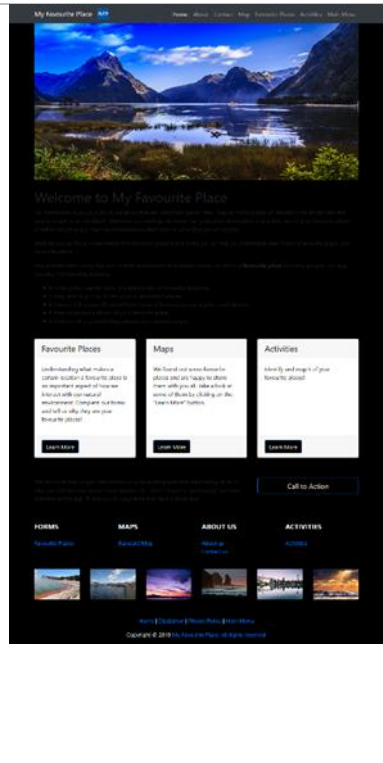



Application	Tools	Platform	Release Date
<i>My Favourite Place – Version 1.0.0</i>	<i>Website 0 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.1</i>	<i>Website 1 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.2</i>	<i>Website 2 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.3</i>	<i>Website 3 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.4</i>	<i>Website 4 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.5</i>	<i>Website 5 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.6</i>	<i>Website 6 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.7</i>	<i>Website 7 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>

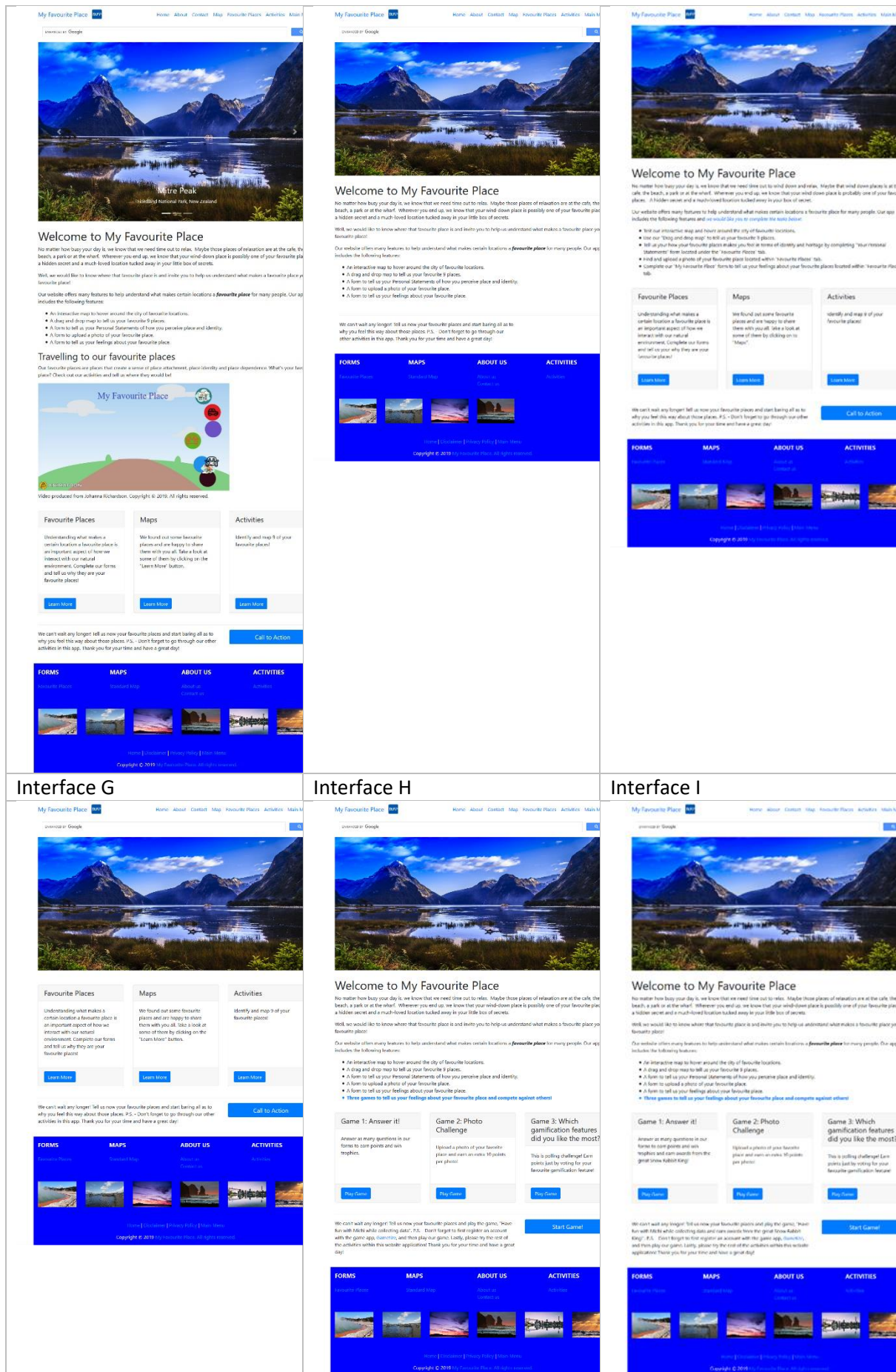
<i>My Favourite Place – Version 1.0.8</i>	<i>Website 8 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.9</i>	<i>Website 9 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.10</i>	<i>Website 10 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.11</i>	<i>Website 11 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 1.0.12</i>	<i>Website 12 (Survey One)</i>	<i>Desktop</i>	<i>September 4th to 10th, 2019</i>
<i>My Favourite Place – Version 2.0.0</i>	<i>Prototype (Survey One)</i>	<i>Android</i>	<i>September 4th to 10th, 2019</i>

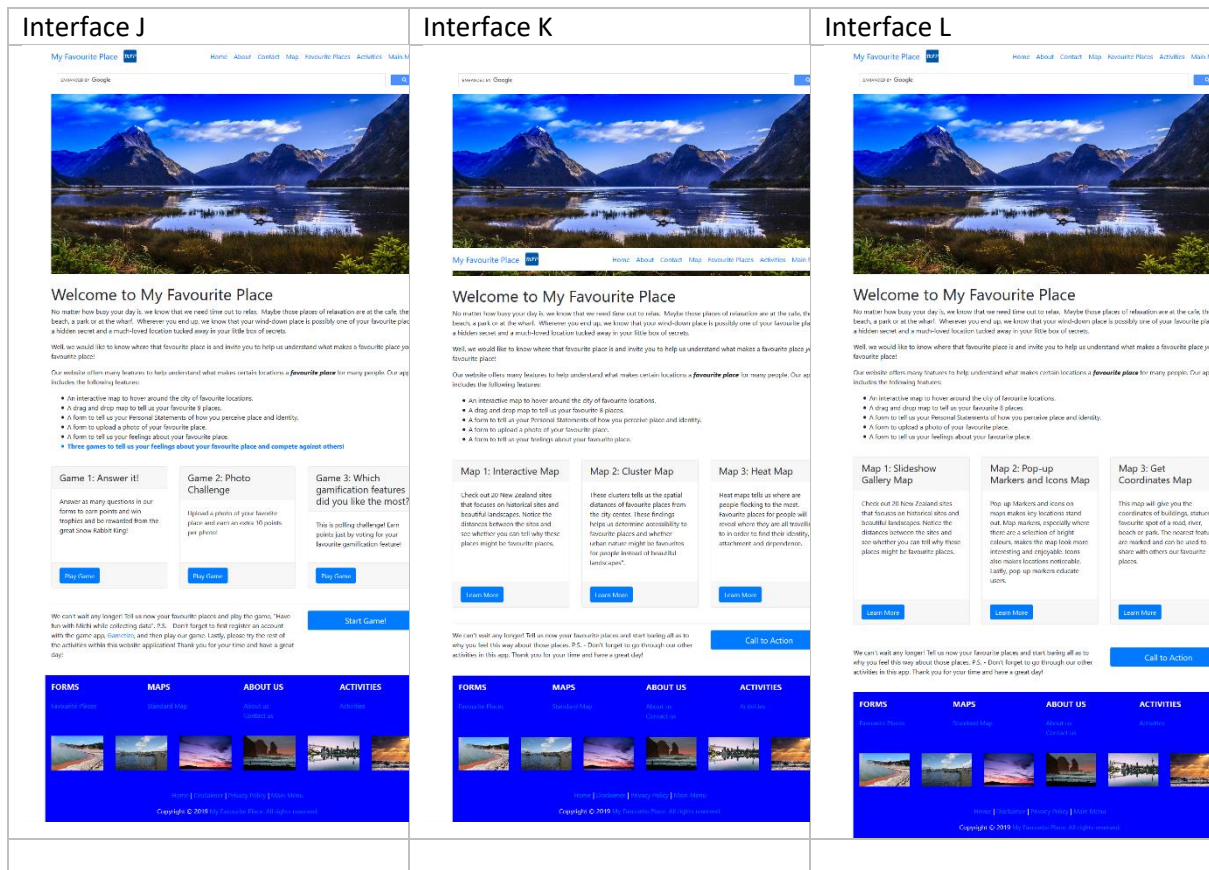
10.13 Appendix M

Table M 1

Twelve Experimental Interfaces

<p>Interface A</p> 	<p>Interface B</p> 	<p>Interface C</p> 
<p>Interface D</p> 	<p>Interface E</p> 	<p>Interface F</p> 





10.14 Appendix N

Table N 1

User Persona 1.

Name:	Vince Smith
Age:	25 years old
Education:	University Engineering student
Occupation:	Aviation engineer (Part-time contractor)
Technology:	Apple iPhone 11 mobile phone, Apple 11 iPad Pro (Gen 2), and an Apple iMac 27”.
Background:	Vince is a busy student and works part-time. He engages in social media activities particularly Reddit, and he is interested in games, movies, bitcoin, and birds. He is a member of a group and very checks his alert notifications from his social media accounts.
User needs:	Fast loading time for a web application, prefers a website that does not have too many words and content. An app that is simple to sue, and would like an application that is compatible with his Apple technology.
User goals:	To use a web application that is interesting, enjoyable and educational. Prefers using an app that can let him do things within less than 3 clicks.

Table N 2*User Persona 2*

Name:	Sandra Piper
Age:	32 years old
Education:	Graduate of Computer Science
Occupation:	Projects Manager at Winter Shoes Warehouse
Technology:	Apple iPhone 11 mobile phone, HP EliteOne 800 G5-All-in-One.
Background:	Sandra travels across New Zealand leading the project task of installing their new in-house system for new application of ordering winter shoes. As the projects manager, Sandra both managing the project team which keeps her busy and reliant on technology.
User needs:	A web application that is simple to use, quick and allows her to use the website and achieve tasks within 5 to 10 minutes. The application could be bright, fun and has future potential. Sandra uses both the Apple platform as well as Microsoft Windows operating system.
User goals:	To use an app that she finds interesting with icons and buttons that link to specific webpages quickly. The system co should have a fast loading time and should allow me to perform the tasks I need to accompli while using that application.

10.15 Appendix O

My Favourite Place Website in Wales

Figure O 1

Home Page

Home Page.

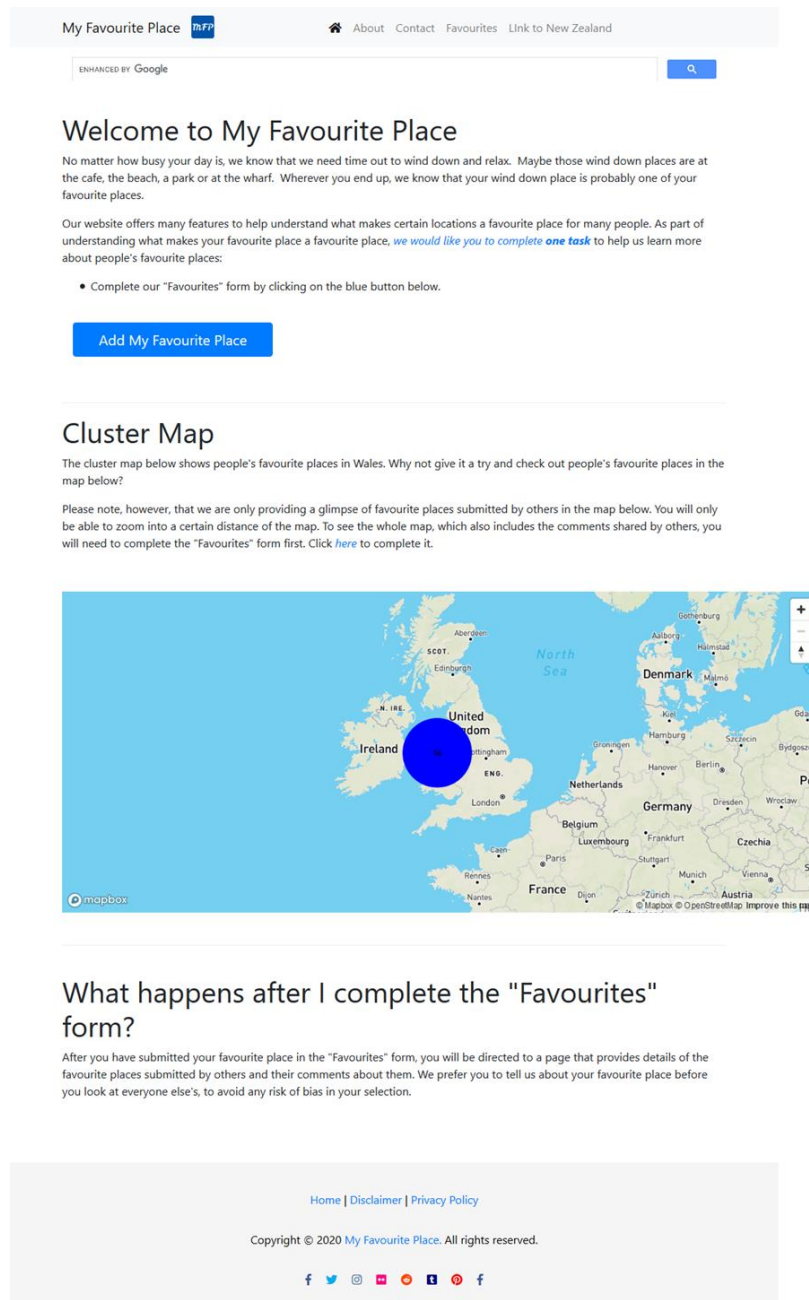


Figure O 2

About Page

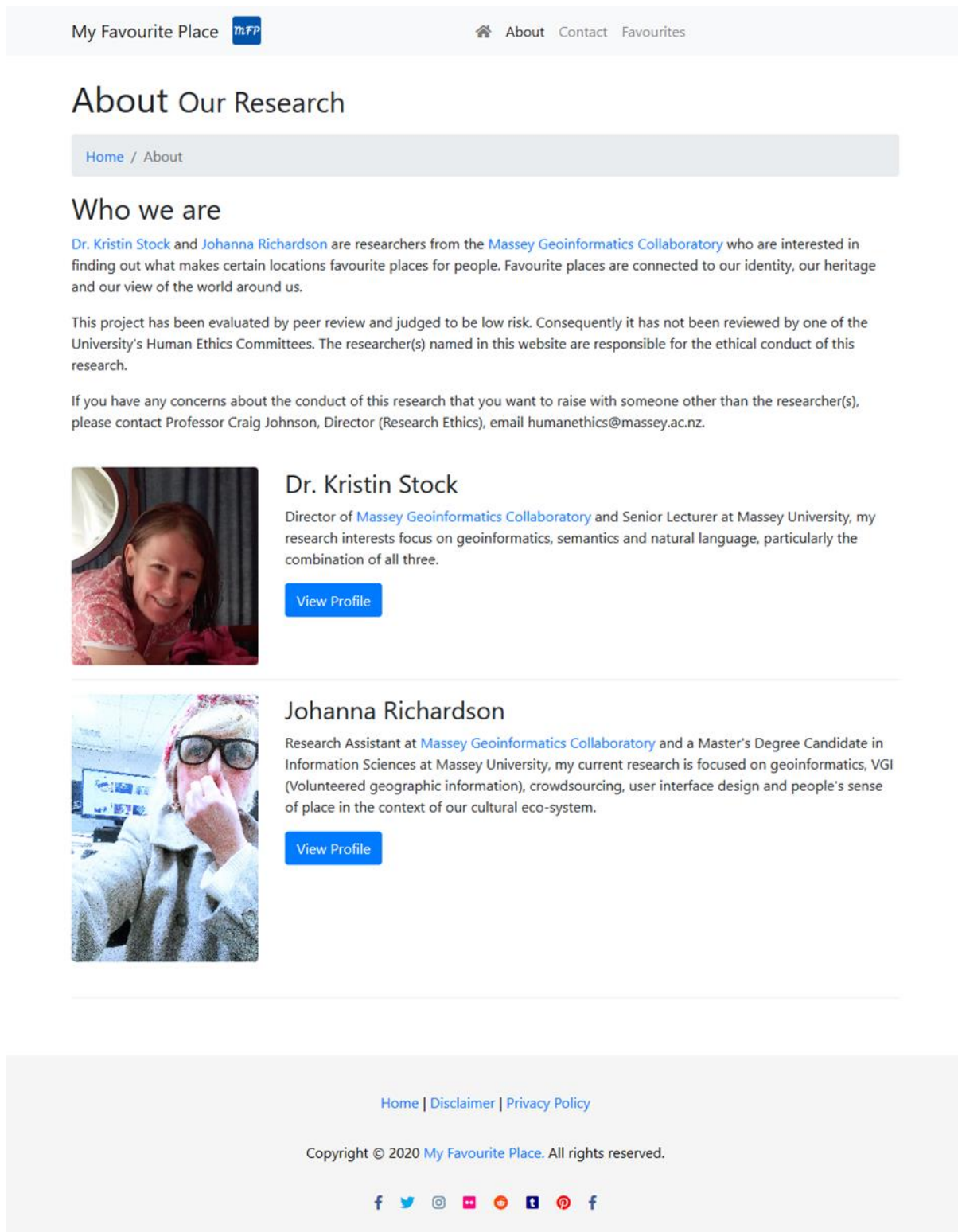


Figure O 3

Contact Page

Contact Send us a message

[Home](#) / [Contact](#)

Contact Details

Dr. Kristin Stock or Johanna Richardson
Massey University
Albany Highway, Albany

P: +64 (09) 414 0800 ext. 43719

E: K.Stock@massey.ac.nz

E: johannarichardson5@gmail.com

H: Monday to Friday: 9:00 AM to 5:00 PM

Send us a Message

Name

Email

Phone Number

Message

[Send Message](#)[Reset Form](#)[Home](#) | [Disclaimer](#) | [Privacy Policy](#)

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Figure O 4

System Feedback

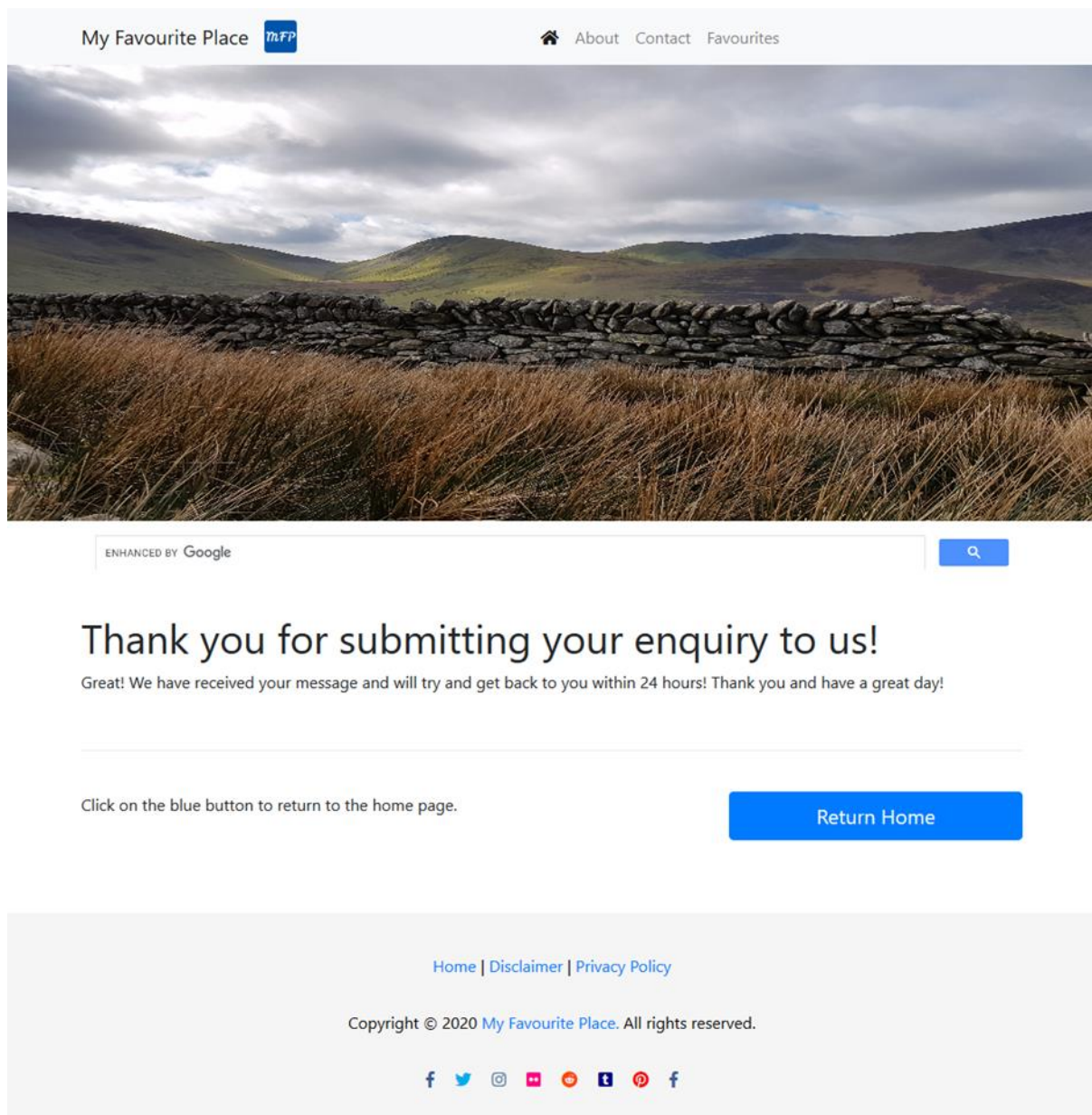


Figure O 5

Favourite Page

[illegible]

Figure O 6

Favourite system feedback

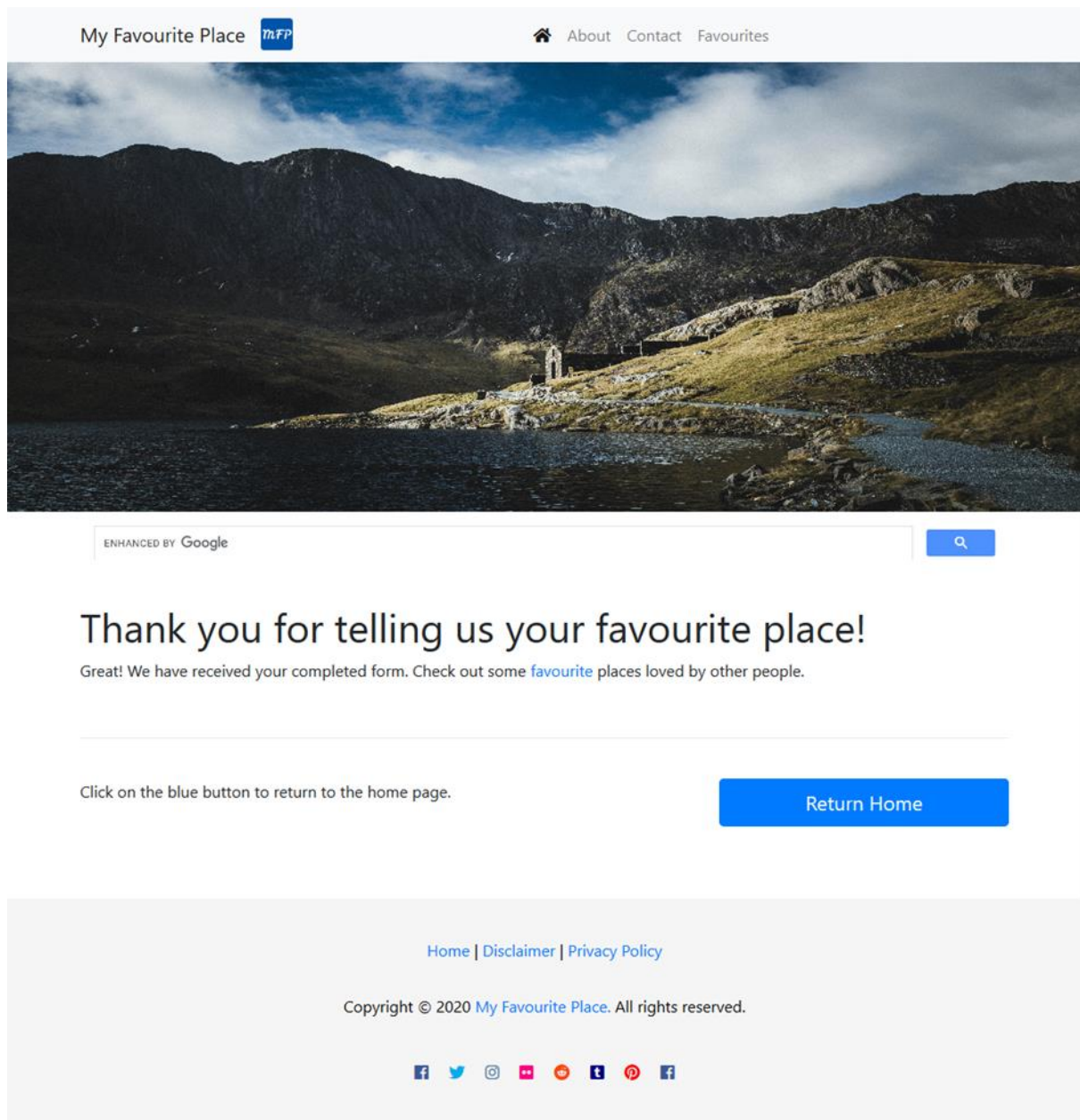




Figure O 7

Consent page.

My Favourite Place 

 [About](#) [Contact](#) [Favourites](#)

Consent Consent Awareness

[Home](#) / [Consent Form](#)

What you are consenting to

This project has been evaluated by peer review and judged to be low risk. Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this website are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.

By continuing with the survey, you are agreeing to participate in this study, and confirming the following:

- I understand the purpose of the survey as explained in the <https://myfavouriteplace.massey.ac.nz/Wales/index.html> website.
- I understand that the research will involve completing a survey of up to 15 minutes or less.
- I understand that I may withdraw from this study at any time without having to give an explanation.
- I understand that no identifying information will be stored about me (the researchers will not store my IP address, browser history, name, email address, computer name, or any other identifying information).
- I understand that the answers I provide will be used solely for research purposes and will be retained by the researchers for up to 5 years.
- I understand that you will be discussing the research project, survey responses and findings with others at Massey University, Albany, Auckland and other organizations or universities.
- I give my consent for the comments and statements I provide (and I understand that no identifying information will be attached to these) to be shared with other researchers and included in research publications where appropriate.

If you would like more information about this research, please ask the researcher, [Dr. Kristin Stock](#).

Thank you.

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Figure O 8

Disclaimer Page

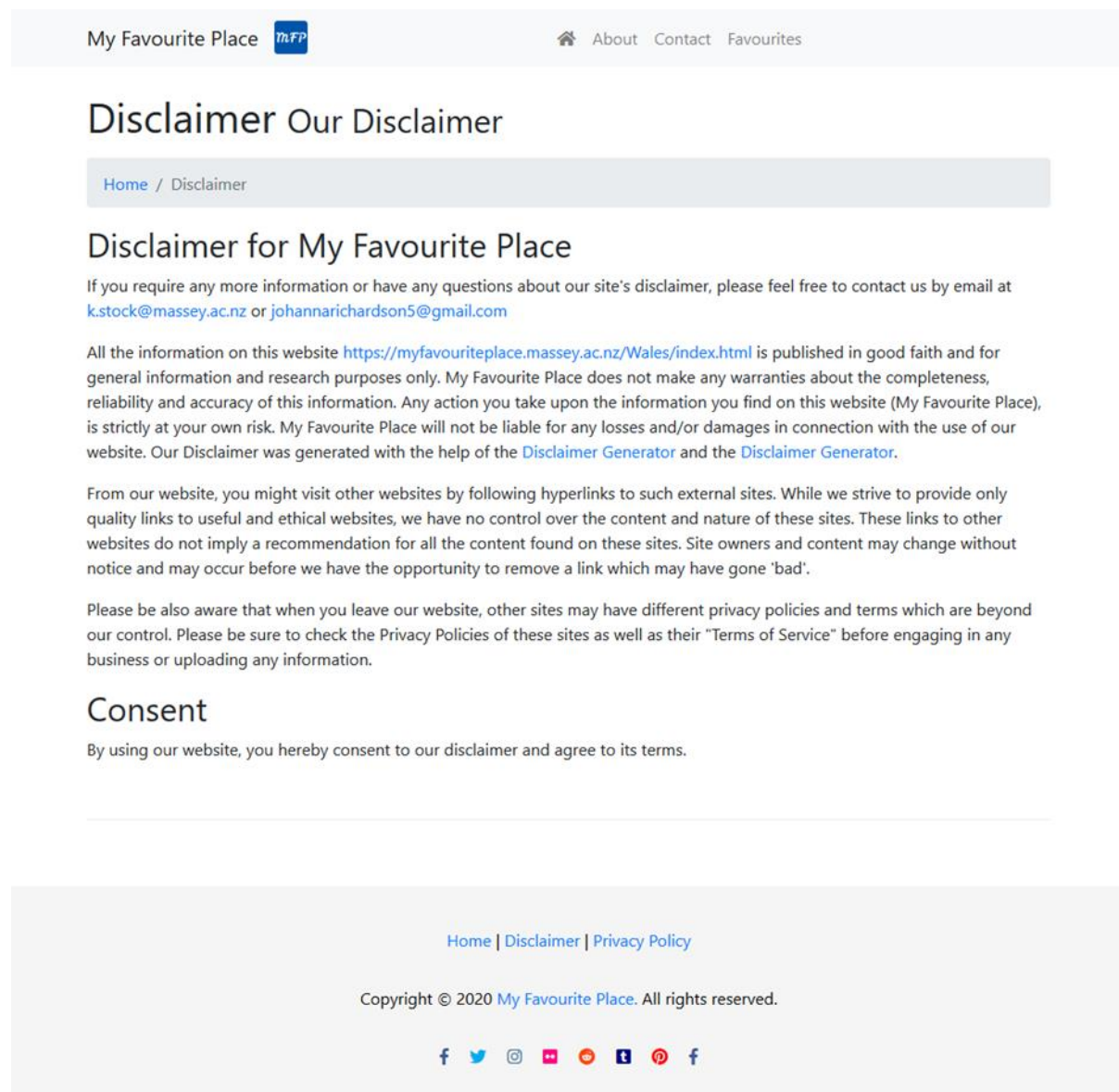
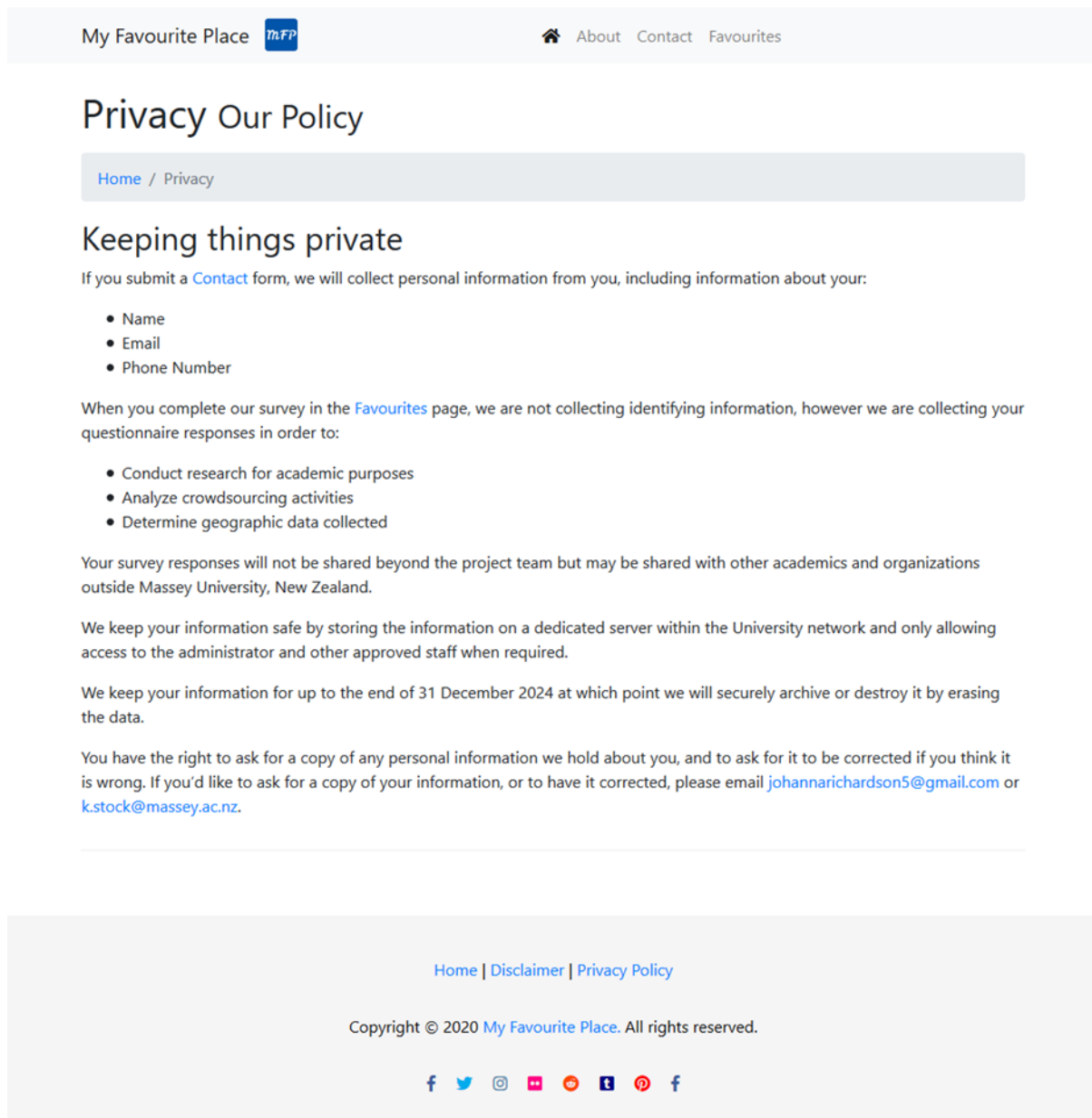


Figure O 9

Privacy Page



10.16 Appendix P

COVID-19 Alert Level System in New Zealand

This table contains data that was taken from the COVID-19 Alert System website⁶.

Table P 1

*COVID-19 Alert System for New Zealand*⁷.

Alert Levels	Dates	Impact	MFP Project
Level 2	Saturday 21 st of March 2020		Pilot study began on the 13 th of March 2020. First person completed on 24/3/2020.
Level 3 at 1:30 pm	Monday 23 rd of March 2020		Pilot study in progress.
Level 4 at 11:59 pm	Wednesday 25 th of March 2020		Pilot study in progress. Three people completed on 8/4/2020. One person completed on 10/04/2020.
Level 3 at 11:59 pm	Monday 27 th of April 2020		No survey conducted.
Level 2 at 11:59 pm	Wednesday 13 th of May 2020		Launched the website on the 6 th of June 2020. Survey begins.
Level 1 at 11:59 pm	Monday 8 th of June 2020		First person completed the

⁶ Covid-19 Alert System, *History of the COVID-19 Alert System* [website], <https://covid19.govt.nz/alert-system/history-of-the-covid-19-alert-system/>, (accessed 19 January 2021).

			main survey on the 13/6/2020.
Level 3 at 12:00 noon	Wednesday 12 th of August 2020	Auckland city	Survey 3 in progress.
Level 2 at 12 noon	Wednesday 12 th of August 2020	The rest of New Zealand except Auckland	Survey 3 in progress.
Level 2 (with extra restrictions) at 11:59 pm	Sunday 30 th of August 2020	Auckland city	Survey 3 in progress.
Level 1 at 11:59 pm	Monday 21 st of September 2020	The rest of New Zealand except Auckland	Survey 3 in progress.
Level 2 at 11:59 pm (with no extra restrictions)	Wednesday 23 rd of September 2020	Auckland city	Currently 107 responses as at 4 th of October 2020.
Level 1 at 11:59 pm	Wednesday 7 th of October 2020	Auckland city	Survey 3 in progress.
Level 3 at 11:59 pm	Monday 15 th of February 2021	Auckland city	Results Analysis of Survey Two and Three & Writing the Thesis
Level 2 at 11:59 pm	Monday 15 th of February 2021	Rest of New Zealand	Results Analysis of Survey Two and Three & Writing the Thesis
Level 2 at 11:59 pm	Wednesday 17 th of February 2021	Auckland City	Results Analysis of Survey Two and Three & Writing the Thesis
Level 1 at 11:59 pm	Wednesday 17 th of February 2021	Rest of New Zealand	Results Analysis of Survey Two and Three & Writing the Thesis

10.17 Appendix Q

Accessed on 15th of February 2021.

Table Q 1

Monkey Learns' Cloud Word Generator for Adjectives

word	count	relevance
good memory	4	0.988
blue water	2	0.494
nice beach	2	0.494
great place	2	0.494
bird life	2	0.494
empty golden beach	1	0.37
clear blue sky	1	0.37
beach town vibe	1	0.37
stunning limestone formation	1	0.37
great outdoors summer	1	0.37
part of north	1	0.37
juxtaposition of land	1	0.37
lot of things	1	0.37
lack of road	1	0.37
lot of people	1	0.37
lot of time	1	0.37
beautiful calm bay	1	0.37
lot of plant	1	0.37
sense of isolation	1	0.37
games of cricket	1	0.37
wild new zealand	1	0.37
riverside bbq area	1	0.37
plenty of bird	1	0.37
kiwi beach town	1	0.37
classic kiwi beach	1	0.37
handful of people	1	0.37
lot of fun	1	0.37
good bonding opportunities	1	0.37
pristine natural environment	1	0.37
mix of bush	1	0.37
beautiful isolated beach	1	0.37
immense natural beauty	1	0.37
rest of nz	1	0.37
beautiful site	1	0.247
great trail	1	0.247
many people	1	0.247

north america	1	0.247
childhood memory	1	0.247
unique location	1	0.247
fond memory	1	0.247
good place	1	0.247
many tree	1	0.247
walkthrough cave-	1	0.247
birth place	1	0.247
great mix	1	0.247
new zealand	2	0.247
nice view	1	0.247
wee field	1	0.247
side ocean	1	0.247
happy memory	1	0.247
hard work	1	0.247
family lunch	1	0.247
small field	1	0.247
adrenaline rush	1	0.247
sealife streaming	1	0.247
community spirit	1	0.247
gorgeous sand	1	0.247
fresh air	1	0.247
amazing place	1	0.247
long way	1	0.247
super quiet	1	0.247
little chapel	1	0.247
beautiful beach	1	0.247
western part	1	0.247
beautiful sanddunes	1	0.247
surf beach	1	0.247
ex girlfriend	1	0.247
human civilisation	1	0.247
wonderful beach	1	0.247
good friend	1	0.247
research center	1	0.247
untouched forest	1	0.247
little noise	1	0.247
native bird	1	0.247
mysterious place	1	0.247
place	12	0.222
lot	9	0.197
tourist	3	0.178
scenery	2	0.158
kids	2	0.126

10.18 Appendix R

Table R 1

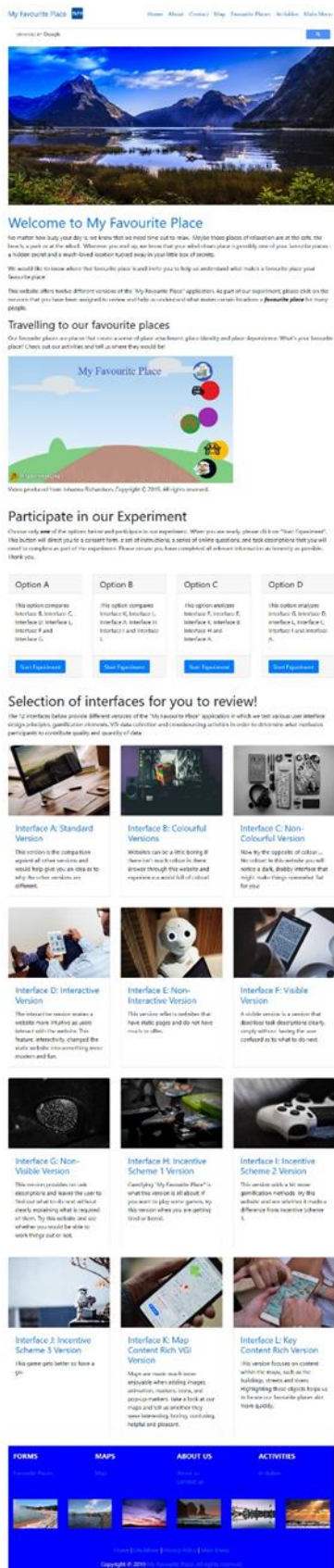
Functional and Non-Functional Requirements.

Requirements Number	Requirements	Functional or Non-Functional Requirements
MFP-001	The website must have a home page.	Functional
MFP-002	The website must have an about page with Massey University's ethical statement mentioned.	Functional
MFP-003	The website must have a contact page with the researchers phone, email and the university's address.	Functional
MFP-004	The website must have a contact form in the contact page.	Functional
MFP-005	The contact page must have a map displaying the location of the university.	Functional
MFP-006	The application must have an online survey form.	Functional
MFP-007	The online survey form must have fields for data input of name, gender, age, comments, photo upload function, and a submit button.	Functional
MFP-008	The survey must have a digital online map on the same page as the online form.	Functional
MFP-009	The home page must have a button that directs the user to the online form.	Functional
MFP-010	The system needs to load and display the pages correctly and within a reasonable loading time.	Non-functional
MFP-011	The online form must be connected to a database.	Non-functional
MFP-012	The system needs to perform correctly.	Non-functional

10.19 Appendix S

Figure S 1

Main Website



10.20 Appendix T

Social Media Icons and Images

Social Media Posts for My Favourite Place included QR codes, icons and images.

The blue QR code is for the “Home” page and the purple QR code directs people to the online survey form.

Figure T 1

QR Codes for "My Favourite Place" Website



Characters in Social Media

Three images created by the author to use as avatars and images for social media postings, encouraging users to complete our survey.

Figure T 2

My Favourite Place



Figure T 3

Tommy Gump



Figure T 4

Samantha Poppyhead



10.21 Appendix U

Table U 1

Table of Favourite Places, Number of Locations and Percentages

Favourite Places	Regions	Percentage
Islands of New Zealand	10	9%
Bay of Plenty	16	14%
Auckland	16	14%
Waikato	6	5%
New Plymouth	3	3%
Southland	9	8%
Otago	9	8%
Manawatu	3	3%
Northland	12	11%
Canterbury	4	4%
Hawkes Bay	6	5%
Wellington	4	4%

Tasman	11	10%
West Coast	3	3%
Marlborough	2	2%
Total	114	100%

10.22 Appendix V

Table V 1

Agile Model in the "My Favourite Place" Project.

Phase 1: Planning	Scrum meetings are held regularly to discuss the requirements of the design brief. The specifications of the design is discussed and objectives as to what the system is expected to do and how it should function.	Fortnightly meetings held between the author and supervisor.
Phase 2: Analysis & System Design	The system architecture is reviewed based on the frameworks, software dependencies, operating systems it will be built on. Software compatibility, web design, coding script languages and the types of tools required are discussed and decided upon to determine the best way to build the application.	Frameworks chosen was Bootstrap 4.5.3, using the Start Bootstrap Modern Business website template. Start Bootstrap is licensed under a MIT license. Start Bootstrap is an open source library and is modelled like the Bootstrap framework (davidtmiller, 2020).
Phase 3: Implementation	Coding and languages are written up and worked on to ensure the application functions and are communicating to each other and performing as they should. Protocols are installed to enable devices to communicate with each other both within the same local network and outside the public network.	Languages used: HTML, CSS, Javascript, Php , SQL code.
Phase 4: Testing	Unit test cases are written up and executed to ensure databases are communicating, and codes are performing the expected outcomes with a pass or fail results.	Web testing.
Phase 5: Evaluation	Test scripts are tested and evaluated by the test writer. Users, and the MFP project team test the application. Unit tests, usability tests and systems testing must all have a pass rate. Website testing is also conducted using W3C standards,	Evaluated by author and supervisor.

	tests through use of the selenium web driver, tests using online software tools to test and rate the websites performance, speed and compliance.	
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10.23 Appendix W

Table W 1

Table of Ten Design Factors

How design aspects help?	Claim	Design Variable	Evidence
Task descriptions tells users what they need to do.	Clearly defined task descriptions needs to be visible, preferably in the home page, and they need to know what is expected of them.	Task Descriptions	Participant 2 and Participant 7 found that task descriptions would help them.
Motivation	Task descriptions needs to be specific and simple.	Intrinsic motivation	Participant 2 and Participant 8 said they would more likely be motivated to contribute data if they knew what exact tasks were required from them.
People have preferences for certain colours.	Choosing colours for buttons vary based on users preferences for colours.	Colour	Participants in Option A preferred red buttons than black buttons, blue font more than black font. Participants in Option D preferred black buttons more than red.
Designing online forms with radio buttons, check boxes and buttons can make the user experience more enjoyable.	Interactive forms can be enjoyable when form features are varied. User experience is enhanced when colour is added to the design of the web application which could include the online form.	Form Features Interactivity	Participants in Option A found the use of buttons made the user experience more enjoyable. Also, participants Options A and D selected a range of form features they preferred, ranging from radio buttons, check boxes, text fields, text area box, uploading a

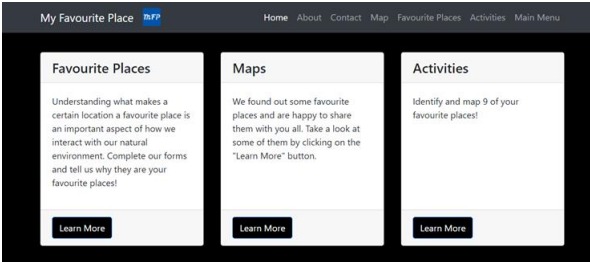
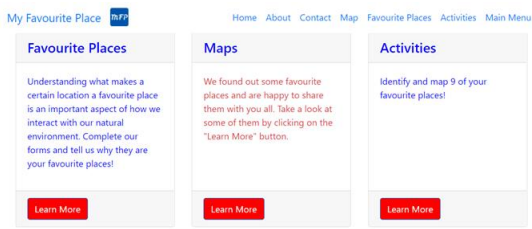
			photo, the "Submit" buttons, to all of the above.
An application that is simple to use is good.	An interface is better when the design is simple and the layout is less clustered. This is a challenge but the responses show this was preferred by participants in Option B.	Simple to use	<p>Participants were asked to “click on every page and select which feature they liked the most” about Interface A, the standard interface. Participants in Option B liked Interface A:</p> <p>67% simple to use 33% clean layout</p> <p>Participant in Option C liked Interface A: 100% simple to use.</p>
Interesting map design features such as icons, pop-up text boxes or pop-up photos would be preferred.	Maps that displays icons, pop-up boxes and photos offer better user engagement with interesting visual map design features.	User Engagement Map Design	Participants in Option B would prefer a map that displayed icons, pop-up text boxes or pop-up photos of the location, more than a static map.
Rewards would motivate some to contribute data.	Gamification elements can offer some intrinsic motivation.	Gamification	Participants in Option B agreed that receiving rewards would motivate them to continue contributing data even more.
The interaction between the application and the user through system feedback does not necessarily provide any motivation by users to submit data.	System feedback is good interaction between the application and the user.	System Feedback	<p>In this survey, the participants did not view system feedback would increase motivation. Participants 1 and 2 in Option A answered 50% yes and 50% not sure.</p> <p>In Option B, participants 9 and 10 answered “No”.</p>

10.24 Appendix X

Table X 1

Option A

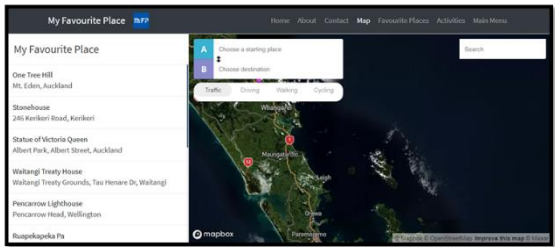
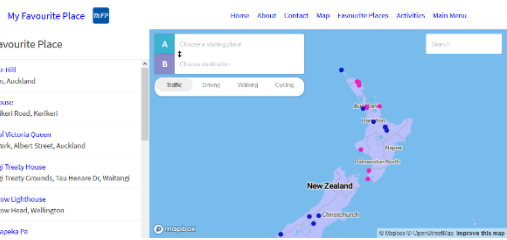
Interface B – Colourful Version	Interface C – Non-Colourful Version
Q20 - Do you think red buttons or black buttons are stimulating?	



100% found the red buttons to be more stimulating.

Participants reviewed interface C, an interface with a dark background and grey or black text that contrasted against white boxes. The chosen design variables was to test readability and whether the dark font would be legible enough for people to read (Allan et al., 2016). According to W3C, some prefer a contrast of a white background on black text, or a black background on white text. Or a medium contrast like grey text on a black background (Allan et al., 2016).

Q21 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?
--



100% found the blue font more stimulating than the black font in Interface C.

Q22 - For a comparison, would you feel more motivated contributing data on the Interface B website more than the Interface C website?

100% participants responded, “I would feel more motivated contributing data on the Interface B website.” A colourful interface was preferred over a dark interface.

Table X 2

Option B

Interface L – Key Content

Q11 - How many pop-up icons can you see in the pop-up map? Hint: zoom out and look out for little grey icons.

Participants had to zoom out to see the little grey icons to answer this question. The correct answer is 9.

34% responded “Other – 1”.

33% responded “9”.

33% responded “Other – 14”.



Q25 - Do you think colour, map markers, pop-up icons, photos and a hover function in maps would motivate you to contribute data?

34% said “Yes”.

33% said “Maybe”.

33% said “Not sure”.

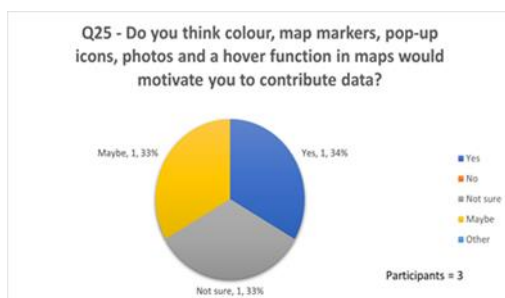


Table X 3

Option C

Interface K – Map Content

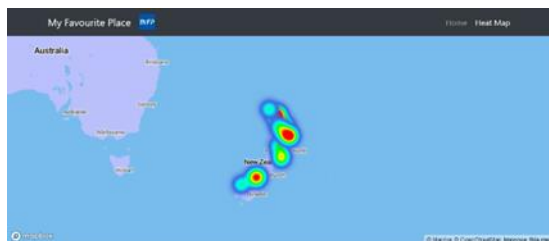
Q22 - In the cluster map, how many clusters can you see?

100% all answered 3. The correct answer was 3.



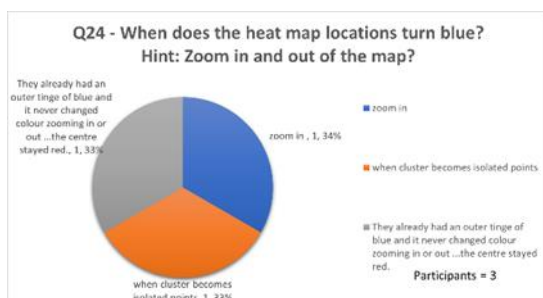
Q23 - How many red circles can you see in the heat map?

The participants were asked to identify the number of red circles in a heat map. The correct answer was 3. They all answered correctly.



Q24 - When does the heat map locations turn blue? Hint: Zoom in and out of the map.

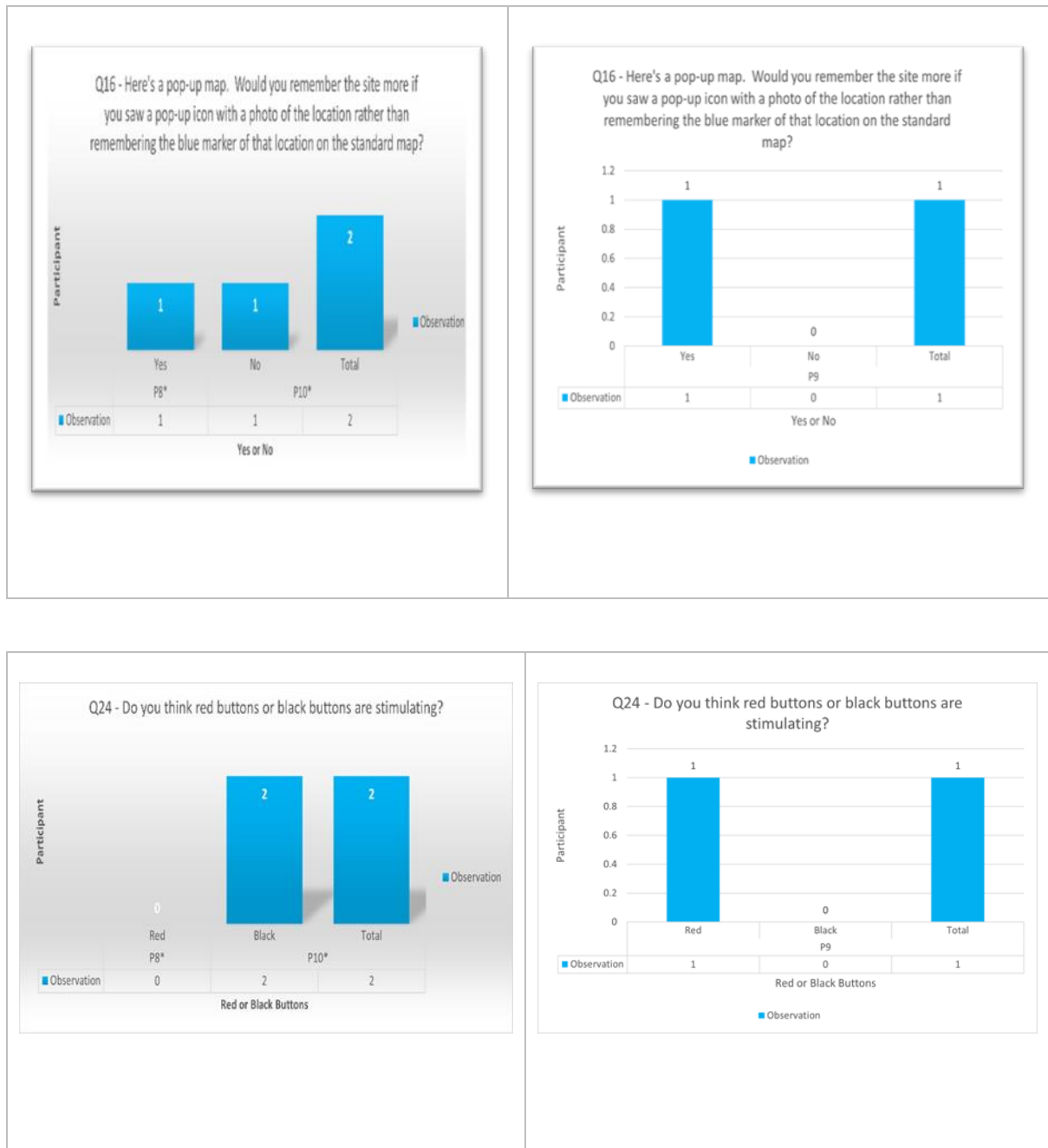
Participants were asked to explain when a heat map turns blue. This question was to find out whether participants understand map content. The graph below shows comments shared by respondents who have some knowledge of maps.



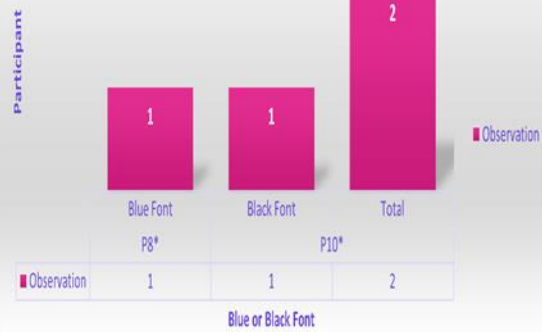
In designing maps for VGI it is good to choose maps that users will understand, or it would be important to provide some information about what type of map that has been used and what it does.

Table X 4

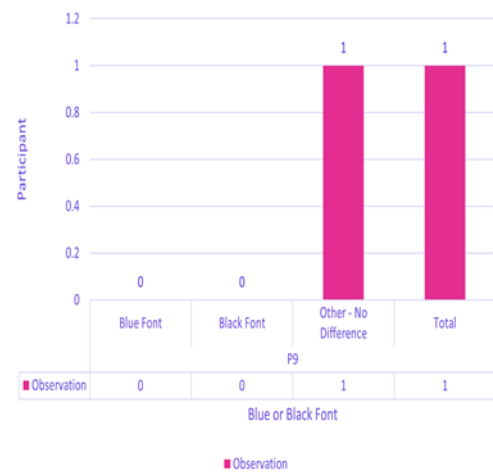
Option D



Q26 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?



Q26 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?



10.25 Appendix Y

Table Y 1

Five Correlations from a Correlation Matrix

Correlations	Personal Statement	R-Value
1. Attached and Identify	“I am very attached to this place.” “I identify strongly with this place.”	0.617655
2. Attached and Dependence	“I am very attached to this place.” “I get more satisfaction from visiting this place than any other place.”	0.563511
3. Spiritual and Identify	“I value this place because it is spiritually special to me.” “I identify strongly with this place.”	0.639619
4. Memorable and Relationships	“This place is valuable because it is a place where people can continue to pass down memories, wisdom, traditions or a way of life.” “I like this place because of the stories and myths that links me to this place.”	0.547104
5. Wildlife and Ecological	“I value these places because they provide a variety of plants, wildlife, and marine life.” “These places are valuable because they help produce, preserve and renew air, soil and water.”	0.611412

10.26 Appendix Z

16 Personal Statements

Table Z 1

16 Personal Statements

Number	Personal Statements
1	This place is valuable because it is a place where people can continue to pass down memories, wisdom, traditions or a way of life.
2	I value this place because it is spiritually special to me.
3	I value this place for the attractive scenery, sights, smells, or sounds.
4	This place is valuable because it represents NZ identity
5	I like this place because of my genealogical links to the land.
6	I like this place because of the stories and myths that links me to this place.
7	I am very attached to this place.
8	I identify strongly with this place.
9	I value these places because they provide a variety of plants, wildlife, and marine life.
10	I get more satisfaction from visiting this place than any other place.
11	I like this place because of its recreational outdoor activities
12	These places are valuable because they help produce, preserve and renew air, soil and water.
13	I feel safe at this place.
14	These areas are valuable because they are wild, uninhabited or relatively untouched by human activity.
15	I value these places for economic benefits such as tourism, forestry, agriculture, or other commercial activity.
16	These places hold their own value and deserves to be here, no matter what I or others think about them, or even if they are actually used.

31 Personal Statements

Table Z 2

31 Personal Statements

	Personal Statements	Measures	Ref
1	This place is valuable because it represents NZ history.	Historical/cultural value	Brown & Weber (2012).
2	This place is valuable because it represents NZ identity.	Historical/cultural value	Brown & Weber (2012). Brown & Raymond (2007).
3	This place is valuable because it is a place where people can continue to pass down cultural memories, wisdom, traditions, or way of life.	Historical/cultural value	Brown & Weber (2012).

			Brown & Raymond (2007).
4	I am very attached to this place.	Place identity	Brown & Raymond (2007).
5	This place gives me a sense of belonging.	Feeling of belonging	Brown & Raymond (2007).
6	I identify strongly with this place.	Place identity	Brown & Raymond (2007).
7	I value this place because it is spiritually special to me.	Spiritual value	Brown & Raymond (2007).
8	I value this place for the attractive scenery, sights, smells, or sounds.	Scenic / Aesthetic value	Brown & Raymond (2007).
9	I value this place because it provide for a variety of plants, wildlife, marine life, or other living organisms.	Natural heritage value	Brown & Raymond (2007).
10	I get more satisfaction from visiting this place than any other place.	Place dependence	Brown & Raymond (2007).
11	I like this place because of its recreational outdoor activities.	Recreational value	Brown & Raymond (2007).
12	I find this place to be very special to me.	Place identity	Brown & Raymond (2007).
13	I value these places because they help produce, preserve, and renew air, soil, and water.	Life-sustaining value	Brown & Raymond (2007).
14	I value these places for economic benefits such as tourism, forestry, agriculture, or other commercial activity.	Economic value	Brown & Raymond (2007).
15	I value these places because we can use them to learn about the environment.	Learning value	Brown & Raymond (2007).
16	I value these places because they provide for a variety of plants, wildlife, marine life, or other living organisms.	Biological diversity value	Brown & Raymond (2007).
17	These places are valuable for their own sakes, no matter what I or others think about them, or whether they are actually used.	Intrinsic value	Brown & Raymond (2007).
18	I value these places because they have natural and human history.	Heritage value	Brown & Raymond (2007).
19	I value these places because they allow future generations to know and experience them as they are now.	Future value	Brown & Raymond (2007).

20	I value these places because they are wild.	Wilderness value	Brown & Raymond (2007).
21	These areas are valuable because they help produce, preserve, and renew air, soil, and water.	Ecological/Life sustaining	Brown & Weber (2012).
22	These are valuable because they provide areas for indigenous (native) wildlife to live and/or opportunities for humans to observe.	Native wildlife	Brown & Weber (2012).
23	These areas are valuable because they sustain areas of indigenous (native) plants.	Native vegetation	Brown & Weber (2012).
24	These areas are valuable because they support marine life.	Marine value	Brown & Weber (2012).
25	These areas are valuable because they are wild, uninhabited, or relatively untouched by human activity.	Wilderness	Brown & Weber (2012).
26	I like this place because it is a place marked by history.	Historical and heritage value	Lecompte, A.F., Trelohan, M., Gentric, M., Aquilina, M. (2017).
27	I like this place because of my genealogical links to the land.	Relationships / Values to landscape	Stephenson, J. (2008).
28	I like this place because of the stories and myths that links me to this place.	Relationships / Values to landscape	Stephenson, J. (2008).
29	I like this place because of the historic events that occurred here.	Practices / Values to landscape	Stephenson, J. (2008).
30	I am committed to this place.	Commitment level	Erdiaw-Kwasie, M. O. & Basson, M. (2018).
31	I feel safe at this place.	Cognitive Places	Erdiaw-Kwasie, M. O. & Basson, M. (2018).

10.27 Appendix AA

Table AA 1

Randomized and Non Randomized Questions in Survey Two

Option D – Interface L : Map Content		
Q16 - Here's a pop-up map. Would you remember the site more if you saw a pop-up icon with a photo of the location rather than remembering the blue marker of that location on the standard map?		
Randomized Participant 8	Randomized Participant 10	Not Randomized Participant 9
(Q19 ⁸ Q16 ⁹) Yes	(Q15 Q16) No	(Q16) Yes

⁸ Random survey question order.

⁹ Original survey question order.

Figure AA 1

Question 16, Option D

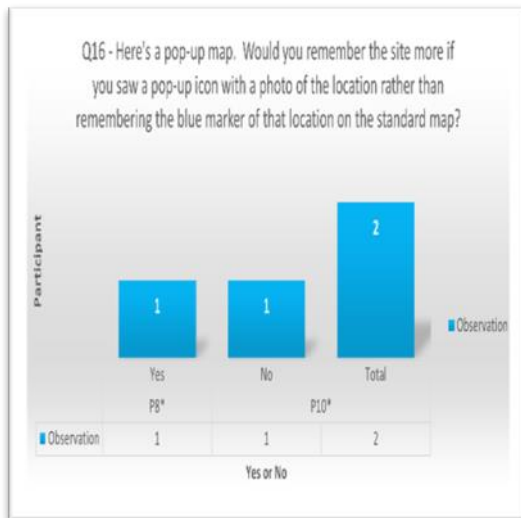


Figure AA 2

Question 16, Option D

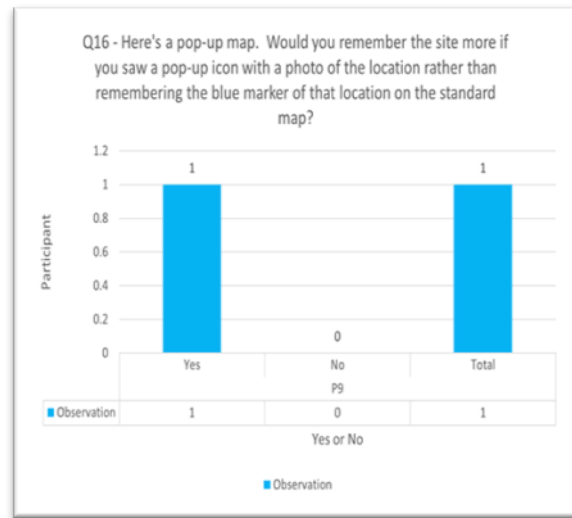


Table AA 2

Option D and Interface C

Option D – Interface C : Non-Colourful

Q24 - Do you think red buttons or black buttons are stimulating?

Randomized Participant 8 (Q27 ¹⁰ Q24 ¹¹)	Randomized Participant 10 (Q20 Q24) No	Not Randomized Participant 9 (Q24) Yes
Hate red buttons - remnisent of early days web in the 90s black buttons better with framed box.	I feel that black buttons are stimulating.	I feel that red buttons are stimulating.

¹⁰ Random survey question order.

¹¹ Original survey question order.

Figure AA 3

Question 24, Option D

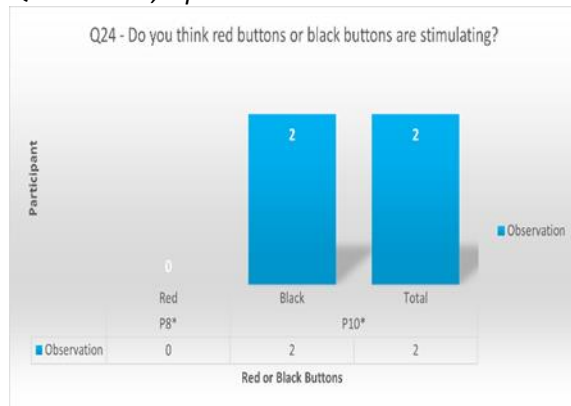


Figure AA 4

Question 24, Option D

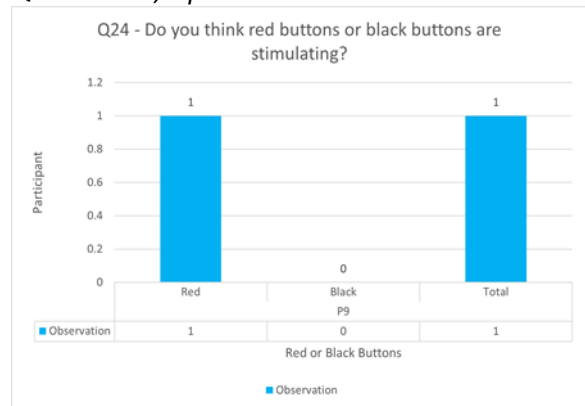


Table AA 3

Option D and Interface C

Option D – Interface C : Non-Colourful

Q26 - How does the blue font in the sidebar of Interface B differ from the black font in the sidebar of Interface C?

Randomized Participant 8 (Q28 ¹² Q26 ¹³)	Randomized Participant 10 (Q22 Q26) No	Not Randomized Participant 9 (Q26) Yes
The blue font colour is more stimulating and my reasons are: Blue colour signifies a clickable link - black doesn't.	The black font colour is more stimulating and my reasons are.	Other - no difference

¹² Random survey question order.

¹³ Original survey question order.

Figure AA 5

Question 26, Option D

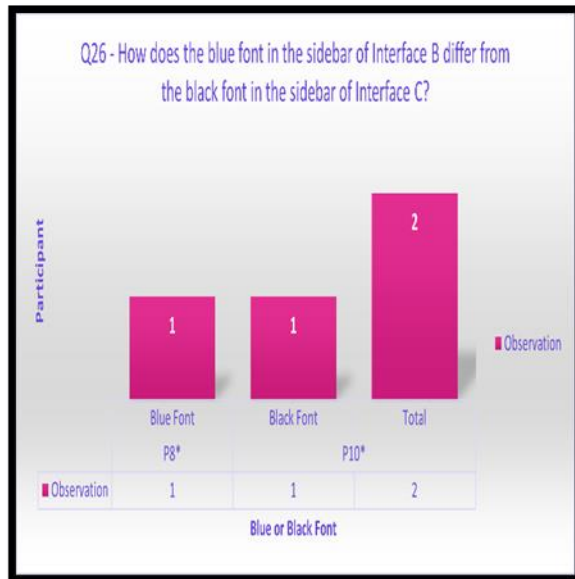


Figure AA 6

Question 26, Option D

