Engaging with our crowd: A study of public cultural heritage institutions crowdsourcing websites in Aotearoa, New Zealand.

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Abstract

The purpose of this study is to assess the degree that New Zealand cultural heritage crowdsourcing websites comply with international best practice and design principles. Following a literature review, the researcher developed a set of 24 recommendations, drawing from research into design heuristics and user motivation.

A content analysis followed. 12 crowdsourcing websites facilitated by New Zealand libraries, museums and an archive were identified and these websites were measured against the 24 recommendations. A quantitative measurement method was used, with a single researcher awarding a rating of either achieved, partially achieved or not achieved for each of the tested criteria. Results are displayed in statistical and chart form, and discussed in narrative form. The 24 recommendations covered four main themes:

1. Promote ease of use
2. Attract and sustain user interest
3. Foster a community of users
4. Show users that their work is contributing to the institution and society.

Category four was the most complied with, while category three showed the least compliance. The results indicated that New Zealand crowdsourcing projects could benefit from engaging their communities by conveying a commitment to biculturalism, engaging more with Māori communities, and supporting offline community interaction.

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1. Introduction

The concept of Web 2.0. has been widely shared throughout the cultural heritage sector for the past decade and the participatory practices of Web 2.0 such as crowdsourcing, social tagging, public commenting and the promotion of user generated content (UGC) have become an integral part of the cultural heritage sector internationally. For many heritage institutions crowdsourcing activities are seen as a relatively inexpensive way to engage with users and to acquire valuable content for their collections (Carletti et al., 2012). This type of user participation in cultural heritage institutions can be seen as an extension of the volunteer involvement that has long supported the function of museums, galleries and libraries worldwide.

The purpose of this study is to undertake a review of cultural heritage institution's crowdsourcing websites in Aotearoa, New Zealand. The study uses a content analysis approach that examines and evaluates the design and features of twelve cultural heritage institutions websites, to observe the ways in which the public is to participate with and to make meaningful contributions to institutions.

A preliminary literature review contributed to an in depth exploration of existing crowdsourcing research and design principles within the cultural heritage sector, with a particular focus on New Zealand.

To gain an understanding of what is considered 'best practice' within the profession, I have undertaken a review of the literature with the aim of integrating the information gathered into a set of evaluation tools, which can be used examine New Zealand crowdsourcing websites. Internationally a number of toolkits and guidelines have been created to support institutions to develop their own projects (Greenhalgh et al, 2010; Gunther, Schall & Wang, 2016; Holley, 2010; Simperl, 2015) as well as studies that investigate factors that influence user participation and motivation in

crowdsourcing projects (Alam and Campbell, 2017; Brandtner, Auinger, & Helfert, 2014; Zheng, Li, & Hou, 2011).

New Zealand Institutions have been quick to adopt crowdsourcing as a way to augment their collections and engage the public, however, I identified a gap in scholarly research on crowdsourcing practices in New Zealand. A number of New Zealand institutions have written reports and presentations on their crowdsourcing projects, many of which have been shared with the professional community in conferences such as the National Digital Forum and LIANZA conference (Perkins, 2013; Johnston & Milburn, 2016; Passau & O'Donovan, 2015). However, these studies and reports are often limited as they portray an institutional point of view, with the potential to contain institutional bias. At the time of writing, no wider national review of crowdsourcing in New Zealand has yet been undertaken.

A number of New Zealand's cultural heritage institutions are tightening budgets after Auckland Council's recent Cultural Heritage Review (Auckland Council, 2018), making this a timely study. Proposed cuts in funding may create a demand for more core work in heritage institutions to be done by volunteers, and crowdsourcing can be a cost effective way for cultural heritage institutions to engage volunteers in creating valuable content and increase value for ratepayers. New Zealand's relatively small population means that there is a smaller pool of potential volunteers to draw from, therefore as the need for volunteer participation grows, it is even more important that crowdsourcing projects are attracting and retaining volunteers.

The commitment of many of New Zealand's cultural heritage institutions to bicultural practices is a unique aspect of New Zealand's heritage sector. Auckland War Memorial Museum's strategic document "He Korahi Māori" reflects this cultural philosophy and the museum's commitment to achieving its "bicultural aspirations" (2016, p2). Te Papa Tongarewa (Te Papa) makes a commitment to biculturalism clear on their website, featuring pages such as "Te Papa's work with iwi (tribes)", "Wānanga (workshops) and hui (gatherings)", and "Funding for iwi" (Te Papa, 2016). Christchurch City Libraries has created a bicultural strategy which commits to

supporting Māori culture and heritage as "the distinct core of New Zealand's bicultural identity" (Christchurch City Libraries, 2012). This is one aspect that sets New Zealand apart internationally and it is important that this biculturalism is reflected in New Zealand's crowdsourcing projects.

This project provides recommendations for crowdsourcing platforms that may help New Zealand's cultural heritage institutions to work more effectively. This can be done by highlighting the opportunities that these institutions have to engage with their users and enrich their collections through crowdsourcing.

2. Key terms

Crowdsourcing: Estelles-Arolas and Gonzales-Ladron-de-Guevaras have proposed a comprehensive definition of crowdsourcing, based on a thorough review of the literature: "Crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organisation, or a company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task" (p.197, 2012). It is a broad and flexible definition, fit for the purpose of this study.

Cultural heritage institutions: Refers broadly to Galleries, Libraries, Archives and Museums that collect and/or care for heritage materials.

User-generated content: Gail Durbin describes user-generated content or UGC in museums as "material created and shared by web visitors relating and responding to the content and ideas of the museum" (p.2, 2011). In this study UGC can include all forms of media including text, images, video and audio and refers to content in any cultural institution that allows users to contribute digitally.

Web 2.0: A participatory and social model of the World Wide Web. One which prioritises "openness, connectedness, participation and ease of use" (Stephens,

p.11, 2006). Web 2.0 reflects a move towards social interaction online via new technologies.

3. Rationale of study

Crowdsourcing projects can only be successful with the engagement and contribution of 'the crowd'. Therefore it is imperative that we understand how to best design crowdsourcing websites to encourage user engagement and contributions. Furthermore the quality of data institutions receive from 'the crowd' is an important factor in the success of a project. Institutions generally wish to encourage the contribution of rich data that can be used to augment collections. Carletti et al (2013) summarise the purpose of crowdsourcing projects into three themes:

1. Exploring new forms of public engagement
2. Enriching institutional resources through the contribution of the crowd
3. Building novel resources (eg. an Archive) through the contribution of the crowd.

This research provides recommendations that will help New Zealand GLAM institutions to refine their approaches to digital crowdsourcing and identify projects that may need improvement. I hope that the recommendations will be a useful resource for future stakeholders and institutions developing their own crowdsourcing projects.

The sampling for this study took place between March and April 2019, providing a snapshot analysis of crowdsourcing practices administered by New Zealand institutions at this time. Crowdsourcing is an evolving practice and it is recommended that further studies on crowdsourcing in New Zealand are undertaken in future, using the same objective and systematic quantification of characteristics to enable longitudinal analysis.

4. Research Questions:

In what ways are crowdsourcing websites of cultural heritage institutions in New Zealand designed to encourage user participation and attract meaningful contributions to their collections?

Sub-question one: What recommendations and best practice guidelines exist for cultural heritage institutions' crowdsourcing websites?

Sub-question two: In what ways do New Zealand's public cultural heritage institutions' crowdsourcing websites adhere to these recommendations and guidelines? Which recommendations are being followed and what are the areas that could be improved on?

5. Literature review:

i. Crowdsourcing

Jeff Howe, a contributing editor at *Wired* magazine, and creator of the blog crowdsourcing.com is often credited for coining the term 'crowdsourcing'. His article "The Rise of Crowdsourcing" in a 2006 edition of *Wired* magazine discussed the emerging practice and defined some of its key features. In the article Howe defined crowdsourcing as "the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call". Howe's definition summarised a commercial approach to crowdsourcing, citing iStockphoto and Amazon Mechanical Turk as examples of crowdsourcing projects. It has been over a decade since Howe published this initial article, and there have been many discussions and definitions of crowdsourcing produced since (Estelles-Arolas & Gonzales-Ladron-de-Guevaras, 2012). In 2008 Kleeman also described crowdsourcing in explicitly commercial terms: "Crowdsourcing is an explicit form of integrating consumer input to commercialization activities" (Cited in Hossain & Kauranen, 2015). This initial

definition of crowdsourcing has changed over time. Cultural heritage institutions, as mostly non-profit organisations, have developed this initial approach to crowdsourcing to suit their specific needs.

Crowdsourcing has been implemented in scientific and business contexts, but is also widely used in non-commercial settings by arts and cultural institutions and non-profit organisations. Enis, writing about best practices in crowdsourcing in libraries, makes the connection between crowdsourcing and the longstanding tradition of volunteerism in cultural heritage institutions (2015). Enis argues that user engagement with institutions and collections can be encouraged by crowdsourcing and this is equally as important as the benefits of outsourcing work. In his words "The goal is not only to create hundreds of thousands of tags (...) a major goal is also to engage people in the digital humanities and in library collections. While the quality of what they do matters a lot, I think the process of what they do matters a lot, too" (2015). This is significant to my project as it emphasises the importance of user engagement with institutions, rather than simply user output.

Alam and Campbell also make the distinction between commercial and non-profit crowdsourcing (2017). Much of the literature on crowdsourcing focuses on commercial organisations, which have very different approaches to the non-profit organisations of the cultural heritage sector (Alam & Campbell, 2017). Like Enis, Alam and Campbell conceptualise crowdsourcing as a new form of "digital volunteerism", that is "neither regulated by contract, nor are participants offered financial incentive" (2017, p.744). A useful definition of crowdsourcing that encompasses both for-profit and nonprofit approaches is the definition established by Estellés-Arolas and González-Ladrón-de-Guevara (2012). The authors analysed over forty existing definitions and synchronised these into an exhaustive and consistent definition of crowdsourcing that can apply universally to crowdsourcing processes. In summary their definition states:

"Crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals

of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task" (Estellés-Arolas, and González-Ladrón-de-Guevara, 2012, p.197).

This definition is suitable to use as a working definition of crowdsourcing in my own research.

ii. User participation

An important factor in encouraging and increasing user participation is understanding who 'the crowd' is. 'The crowd' can be defined in different ways. Estellés-Arolas and González-Ladrón-de-Guevara define 'the crowd' as "a group of individuals of varying knowledge, heterogeneity, and number" (2012, p.197). Howe (2006) suggests that crowdsourcing requires smart and well trained users, but other writers challenge this assumption. Phillips suggests that Museums need to relax authority and control over information and open up to collaboration with diverse audiences (2014, p.248). Holley's approach is similar to Phillips as her research states "the greater the level of freedom and trust you give to volunteers the more they reward you with hard work, loyalty and accuracy" (2010). Some crowdsourcing projects are designed to be of interest to a broad audience, to encourage wide user participation, and conversely some projects are targeted at specific communities of interest (Simperl, 2015, p.7). In their 2013 study of Transcribe Bentham, Causer and Terras suggest that despite attracting large numbers of registered volunteers, many crowdsourcing projects rely on a minority of users (2013) who they refer to as "super transcribers" or "expert volunteers". These expert volunteers are often the ones who sustain the project and do the majority of the work. It is important for institutions to understand which communities their crowdsourcing projects may be relevant to and the factors that motivate these communities to contribute to the projects to successfully engage and retain them.

Alam and Campbell's 2017 study analysed the leading motivations for volunteers participating in cultural crowdsourcing projects and used this analysis to create a

series of recommendations for the design of crowdsourcing systems. The motivational factors they observed were split between intrinsic and extrinsic motivations. Intrinsic motivations were those that emphasised inherent sources of satisfaction, such as fun, a sense of achievement, and a sense of community. Extrinsic motivations were outcomes such as rewards or compensation. The study established that both intrinsic and extrinsic motivations are important factors for motivating participants in crowdsourcing work. Alam and Campbell's findings on volunteer motivation showed the importance of creating a strong sense of community around the crowdsourcing project, providing acknowledgement and rewards for users and catering to personalised topics and local interests of volunteers (2017, p.756). Their study is limited to one specific library project and the sampling pool of volunteers is unusually small, however despite this, the insights and recommendations provided in the article are valuable to draw from when considered alongside the other literature. Simperl's study also distinguished between these types of user incentives, citing intrinsic motivators, extrinsic motivators and financial incentives as important motivational factors. Gamification, peer assessment and feedback were some of Simperl's key examples of ways to incentivise participation (2015). These user motivations and incentives have been an important consideration when developing this set of design recommendations.

iii. Crowdsourcing design

An in-depth case study of a cultural heritage institution's crowdsourcing project is Donelle McKinley's usability study of the UK RED task interface, an open access database and crowdsourcing project created by the English Department of the Open University (UK). In this study McKinley asks the questions "How effectively does UK RED support rich data collection and volunteer participation?" and "what are some alternative approaches to design?". To answer these questions McKinley established seven functionality and usability requirements to support volunteer participation and rich data collection using evidence-based heuristics developed by Petrie & Power. She later expanded these requirements into a list of 21 design principles that were made available on her website nonprofitcrowd.org.

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Website design principles for crowdsourcing cultural heritage

As part of my postgraduate research I developed a set of 21 principles to guide the design and evaluation of websites for crowdsourcing cultural heritage (CCH). The principles focus on supporting volunteer participation and quality contribution, and supplement generic principles for website usability.

The design principles are ranked from the most to least influential on participation and/or contribution quality. Rankings are based on the results of a questionnaire completed by 251 prospective, former and current CCH volunteers.

DOWNLOAD PDF or click on the principles below for explanations, examples, and benefits of compliance:

1. Provide clear, concise, and sufficient task instruction
2. Show how project output is freely accessible to the public
3. Keep content current
4. Minimize the effort to contribute
5. Prioritize key information
6. Minimize user error
7. Enable users to review contributions
8. Clearly identify tasks
9. Present reasons to contribute
10. Provide task options
11. Simplify the task
12. Design is attractive to users
13. Acknowledge participation
14. Encourage users to engage with the collection
15. Display project progress
16. Convey a sense of community
17. Convey the credibility of the project
18. Support community interaction
19. Publicly recognize contributions
20. Support content sharing
21. Convey a sense of fun

Figure 1. Donelle McKinley's 21 design principles taken from her website nonprofitcrowd.org.

McKinley's heuristic evaluation of the UK RED website is a useful model for my own assessment of New Zealand's crowdsourcing initiatives. However the design principles she developed required updating to reflect current research on the topic and the changing nature of the field. In the six years since McKinley's original study was published there have been changes in web-design trends and ways that user's access material on the web. In 2016 mobile web browsing overtook traditional desktop browsing for the first time globally, changing the way that websites were designed and accessed (Gibbs, 2016). Nationally a number of new crowdsourcing projects have been initiated, including Dunedin Public Library's Scattered Seeds

project, and Christchurch City Libraries' Discovery Wall, as well as some ambitious transcription projects developed by Te Papa Tongarewa and Canterbury Museum.

iv. Crowdsourcing in New Zealand based institutions.

New Zealand institutions have adopted a variety of approaches to crowdsourcing over the last 15 years, and used different formats and platforms for their projects. Many of the early online crowdsourcing projects coordinated by cultural heritage institutions in New Zealand were technically simple. Institutions had to be creative in their use of the resources and technology available to them to respond to their user's needs. Cultural heritage institutions such as Te Papa Tongarewa, Auckland War Memorial Museum and Auckland Libraries have used articles, blogs and social media pages to reach their audiences and encourage contributions. This type of approach continues to be successful and calls for information or volunteers are often distributed in this way (O' Donovan & Passau, 2015)

Platforms such as Recollect and Zooniverse have simplified the execution of crowdsourcing projects by delivering a platform with a standard format that can be adapted to an institution's needs, providing institutions with a community of individuals willing to undertake crowdsourcing tasks and the means to promote crowdsourcing projects. Canterbury Museum's G.R. Macdonald Dictionary of Canterbury Biographies project and the collaborative Measuring the Anzacs project are both hosted on Zooniverse. Upper Hutt City Library and Dunedin Public Libraries projects are hosted on New Zealand Micrographic's online community engagement and collection management software Recollect.

A popular locally produced crowdsourcing platform is Horowhenua Library's Kete project. Described as, "An online digital knowledge basket", Kete are repositories of digitised content from public institutions that encourage the public to contribute to topics and upload media to the institution's collection. Kete was originally developed by the Horowhenua Library Trust and Katipo Communications Ltd. as a public website that allowed users to access and contribute to a collection of digitised

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content from the Horowhenua community. Since Horowhenua Libraries launched Kete in 2007 it has been developed into a large network with the development of twelve unique Kete belonging to New Zealand public libraries associated with the Aotearoa People's Network Kaharoa (APNK). Kete is open source software that can be used freely by any institution to create and share digital material online.

Despite the benefits of developing projects on these platforms, many institutions have decided to use a more tailored approach. Examples of purpose built crowdsourcing websites developed by cultural heritage institutions in New Zealand include Online Cenotaph (Auckland War Memorial Museum), Discovery Wall (Christchurch City Libraries) and Manawatū Heritage (Palmerston North City Library).

Auckland Council's 2018 cultural review highlighted international trends in cultural heritage institutions including digitisation and digital access, the interplay of the real and virtual, citizen science, and fostering innovation (2018). The review highlighted the growth of digitisation and digital access projects driving change in museums and galleries internationally.The review highlights the benefits of crowdsourcing and citizen science for the cultural heritage sector, "Citizen science programs not only grow knowledge but engage broader sections of the community with science-based museums and centres" (Auckland Council, 2018). The report also highlighted the need to increase virtual access to digitised collections, and enable visitors to engage with cultural institutions. This support for digital and citizen science projects in the cultural sector is encouraging for New Zealand institutions considering starting their own projects.

Another priority area highlighted in the Auckland Council's 2018 cultural review was "Auckland's unique cultural identity, with Māori and their culture as Auckland's point of difference" (p.12). Dr Spencer Lilley discussed the importance of reflecting Māori cultural identity and New Zealand's Māori/bicultural heritage in New Zealand public libraries in his 2013 Bicultural Evaluation of New Zealand Public Library Websites. He created a set of evaluation criteria that could be used to measure the level of

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Māori/bicultural content of New Zealand's public libraries websites. Some of these criteria were useful examples to refer to when developing the user recommendations for this study. A locally focused community project that conveys a commitment to biculturalism is Auckland Art Gallery's Whakamīharo Lindauer Online. The website is bilingual, and amplifies Māori voices though digitising and translating te reo Māori manuscripts. Although it is not defined as a crowdsourcing project, it contains elements of Web 2.0, encouraging user participation in the form of comments. I suggest that more projects of this kind should be developed in New Zealand to reflect institutional commitments to biculturalism and New Zealand's Māori communities.

The above literature review supports my research into the usability and functionality of crowdsourcing websites both internationally and in a contemporary New Zealand context. Through this literature review I have been able to establish a useful definition of crowdsourcing, and gained an understanding of the variety of crowdsourcing projects that New Zealand cultural heritage institutions have developed, and some of the ways they have been received.

I have developed this research further to create my own set of design recommendations and incorporated them into a thorough content analysis of New Zealand crowdsourcing websites, as discussed in the following sections.

6. Research design / Sample:

The purpose of this study is to review New Zealand cultural heritage institution's crowdsourcing websites using a systematic and standardised approach. I have undertaken a cross-sectional study of New Zealand's public institutions cultural heritage crowdsourcing websites, allowing comparison of individual Libraries, Archives and Museums across New Zealand.

i. Selection of sample:

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Due to the time limitations of this study, the research sample was limited to crowdsourcing websites run by public cultural heritage institutions.

In order to create a list of cultural heritage institutions for review I used information from the Museum's Aotearoa membership directory and the National Library's Directory of New Zealand Libraries. Of the institutions listed on these directories I selected public institutions, and reviewed their websites and social media for any evidence of crowdsourcing projects. I also made a number of general online searches to identify any crowdsourcing projects I might have missed in my initial search.

A number of projects were identified for investigation, developed by public cultural heritage institutions (limited to public art galleries, libraries, museums and archives) located throughout New Zealand. The majority of these institutions were located in urban centres or cities with the funding and visitation numbers to help support a crowdsourcing project. However a number of regional institutions have undertaken crowdsourcing projects using open-source crowdsourcing software provided by the Kete model.

The crowdsourcing projects ranged from relatively simple fixed term transcription projects, to larger ongoing social history projects. Basic project information was collected from each institution, as described in Table one.

Table one: Basic project information captured.

Project title	Institution/key stakeholders	Institution type	Website URL
Title of crowdsourcing project as indicated on the institution's website.	Names of the institution/s involved in producing the project.	Type of heritage institution. For example: Museum, Art Gallery, Library or Archive.	URL of crowdsourcing project's website.

Crowdsourcing type	Platform used	Year launched	History
ie. Transcription, photo identification, recording/creating content, tagging, correcting/modifying content, contextualisation, cataloguing, commenting.	The name of the platform the crowdsourcing project is hosted by. Ie. Zooniverse, Kete, Facebook.	Year project was officially launched to the public.	A brief description of the project and some background information.

ii. Researcher's perspective:

As a current employee of Auckland War Memorial Museum and a former employee of Auckland Libraries I may have some insights into the projects Online Cenotaph (Auckland War Memorial Museum) and 17 Days of Rykenberg (Auckland Libraries) that I did not have for other projects reviewed. Although every attempt has been made to make this study as objective as possible this should be acknowledged.

Selection criteria:

iii. Scope:

Crowdsourcing projects selected were required to be freely accessible online, and affiliated with at least one public GLAM institution.

In scope:
Projects developed by New Zealand based heritage institutions that support digital crowdsourcing are in scope for this research. This includes purpose built crowdsourcing websites, projects hosted on international crowdsourcing platforms such as Zooniverse, or local platforms such as Recollect and Kete. Some of the projects were accessed primarily through Facebook. Social media websites such as Facebook can be a simple, effective medium for public engagement and have been effectively used for crowdsourcing documentary material in a number of New Zealand institutions.

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Out of scope:

Photo-sharing websites:
Photo-sharing websites such as Flickr are out of scope due to their limited functionality. As Terras suggests, the material uploaded to Flickr by the public is seldom treated as an extension of institutional collections in the same way that other crowdsourced collections are (Terras, 2010, p.435).

Kete projects:
The website www.kete.net.nz showcases twelve Kete projects belonging to New Zealand public libraries who are members of Aotearoa People's Network Kaharoa (APNK), and four Kete projects by other cultural heritage institutions. These projects are based on the open source code supplied by Kete Horowhenua that enables a minor level of customisation. To make my sample more manageable and to avoid duplication of data I have chosen to review the original Kete project Kete Horowhenua and one of the secondary projects by one of the members of APNK, Kete New Plymouth to represent this part of the Kete project.

Other projects:
Auckland Art Gallery's Whakamīharo Lindauer Online project displayed some of the elements of a crowdsourcing website, including a call to action, comment functionality, and the formation of a "Whakamīharo Lindauer Online community", however, the purpose of the site was to inform the public and to promote the institution's Lindauer collection, rather than to engage users in the undertaking of a crowdsourcing task, so this was not included in the study.

The websites were required to be accessible for review, therefore the selection of projects was limited to only those projects that are currently active or ongoing and publicly available. This meant that Te Papa's The Berry Boys project and Auckland Libraries 17 Days of Rykenberg project were removed from the final selection as both projects were complete and parts of the projects were no longer entirely accessible online. After excluding these projects the sample size was 12 projects.

iv. Limitations:

The content analysis methodology used in this study allowed the researcher to examine texts and communication artefacts rather than gather new information through conducting surveys with users or staff involved with the projects. The study focused on the usability and functionality of design elements of websites and information that is publicly available online. Detailed project information such as funding and staffing resources have not been sought out and recorded and therefore were not taken into consideration in the evaluation of the websites. If this information had been publicly accessible it would have been useful to include as funding, staff numbers and institutional support likely has an effect on project outcomes. Future studies could explore this area further. A more in-depth case study in which the researcher conducted surveys with the people managing or overseeing these research projects would be useful to gain a better understanding of some of the contextual aspects of crowdsourcing projects.

As a general rule content analysis typically involves two or three coders to make the process as objective as possible (Leedy & Omrod, 2013, p.149). However as a student project the study was limited to a single coder evaluating the material. Coding content requires interpretation on the coder's part and despite attempts to make the coding process systematic and objective, it cannot be considered without bias.

v. Projects sampled

The sampled crowdsourcing projects ranged from relatively simple transcription projects, to larger ongoing social history projects. The type of crowdsourcing undertaken generally fit into three categories as suggested by Carletti (2012).

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Table two: Crowdsourcing projects selected.

Exploring new forms of public engagement	Enriching institutional resources through the contribution of the crowd	Building novel resources (eg. an Archive) through the contribution of the crowd.
Discovery Wall (Christchurch City Libraries)	Online Cenotaph (Auckland Museum)	Kete Horowhenua (Horowhenua Public Libraries)
Digital NZ Stories (Digital NZ - National Library of New Zealand)	Measuring the Anzacs (Auckland War Memorial Museum, Archives New Zealand, University of Minnesota)	Kete New Plymouth (Puke Ariki)
	William Ockleford Oldman Archive Research Materials (Te Papa Tongarewa, National Museum of the American Indian, The Smithsonian Institution)	Scattered Seeds, He Purapura Marara (Dunedin Public Libraries)
	G.R. Macdonald Dictionary of Canterbury Biographies (Canterbury Museum, University of Canterbury)	Recollect: Upper Hutt City Libraries Heritage Collections (Upper Hutt City Libraries)
	Hudson Registers (Te Papa Tongarewa)	Manawatū Heritage (Palmerston North City Library)

7. Methodology:

I used content analysis, a primarily quantitative methodology in this study. I have chosen this methodology as it is considered to be an "objective, systematic and quantitative examination of communication content" (Kim & Kuljis, 2010, p.369), that is useful for evaluating and comparing a number of texts. Kim and Kuljis (2010) have done a thorough investigation into using content analysis on web-based content, in particular Web 2.0 websites, providing valuable insight into the benefits of the content analysis approach and some of its challenges. Advantages to the approach are its unobtrusive and unobstructive nature, it is context sensitive, able to cope with

a large quantity of data, and examines the artefact of communication rather than the user directly. It is a valid and replicable method for making inferences from observed communications to their context (Krippendorf, 1980). A disadvantage of the approach can be that is does not always work well with the dynamic nature of the web. The authors suggest that this can be overcome by prompt data collection. Cox et al used a content analysis approach in their study "Defining and Measuring Success in Online Citizen Science" (2015) and researchers such as Sharma (2011) and Black (2014) have used this methodology to examine cultural heritage institutions websites. My research uses a similar methodology to examine and evaluate the crowdsourcing websites of heritage institutions in Aotearoa, New Zealand. To address the issue of time sensitivity the data used in this study was collected over a period of two months between March and April 2019 .

Content analysis alone is able to provide speculative answers rather than definitive conclusions (Kim and Kuljis, 2010) and my findings support generalised recommendations for New Zealand cultural heritage institutions, however further study will be needed to provide definitive recommendations for specific institutions.

I began my study by undertaking an initial literature review to gather information from the body of literature pertaining to crowdsourcing in cultural institutions, as well as crowdsourcing in a more general sense. I gathered documentation of crowdsourcing projects, including case studies, conference papers and reports to gain a clearer sense of the range of crowdsourcing initiatives being undertaken. The next step of my research was collecting data on design recommendations for crowdsourcing websites, crowdsourcing guidelines and best practice guidelines.

I used a systematic analysis to identify themes and patterns in the literature on the design of crowdsourcing websites, and extracted common elements from the literature. The themes were summarised into four main sections.

1. Promote ease of use
2. Attract and sustain user interest

3. Foster a community of users
4. Show users that their work is contributing to the institution and society.

Informed by this literature review I developed a list of 24 recommendations for New Zealand crowdsourcing websites, based on Donelle McKinley's crowdsourcing design requirements, which themselves were based on a set of heuristics designed by Petrie and Power (McKinley, 2012, p.71). A list of the 24 recommendations along with citations from the literature review is available in Appendix 3. These design recommendations have helped me to answer sub-question one.

Once the recommendations were established I used the tabulation of this data to assist with the analysis of the features and content of my sample websites to help answer sub-question two (selection criteria for this sample is described in section 6 of this report). I examined the sample websites against the 24 recommendations, systematically recording examples of compliance or non-compliance with each specific recommendation. The websites were reviewed following a simple process of first examining the home page of the website and then the following pages of the site, registering for an account if a registration option was given, and contributing various types of content to the website. Field notes and screenshots were collected to document examples of the websites compliance or non-compliance with the recommendations. The design and functionality of the websites were tested on a desktop computer as well as a smartphone and a tablet to test for mobile functionality. The coding manual used is available in Appendix 3.

Once this data was gathered it was entered into an Excel table (Appendix 5.) and the data was simplified. Sections of websites that displayed evidence of full compliance with recommendations were given a rating of Achieved, those that displayed no evidence of compliance were giving a rating of Not Achieved and those that partially complied or had examples of both compliance and non-compliance were given a rating of Partially Achieved. For example, when reviewing compliance with Recommendation Five, "Provide mobile friendly / responsive design", websites that were mobile optimised, clear and simple to use were given a rating of Achieved.

Those that were mobile responsive but were not fully functional when accessed via a mobile device were given a rating of Partially Achieved and websites that were not accessible at all on a mobile device were given a rating of Not Achieved. This process was repeated for each recommendation.

Projects were given numerical ratings according to their level of compliance. They were given a score for each recommendation. 1 point was allocated for recommendations that were rated Achieved, 0.5 for Partially Achieved and 0.0 for Not Achieved. This objective and systematic quantification of occurrences of specified characteristics makes it possible for further longitudinal analysis to be conducted in the future.

8. Best practice: recommendations

i. Design recommendations.

Donelle McKinley's research into crowdsourcing in heritage institutions has been a highly influential source. Her study *Functionality and Usability Requirements for a Crowdsourcing Task Interface that Supports Rich Data Collection and Volunteer Participation: A Case Study: The New Zealand Reading Experience Database* (2012) and her *Website design principles for crowdsourcing cultural heritage* (2015) serve as the basis for this set of recommendations.

The evaluation tools below are an updated version of McKinley's design principles, aimed specifically at volunteer crowdsourcing initiatives for cultural heritage institutions in New Zealand. While working on this list of recommendations I reviewed documentation of other crowdsourcing websites, including national and international examples, as well as research on user motivation and engagement.

It must be acknowledged that even within the New Zealand cultural heritage sector crowdsourcing projects "differ widely in their aims, content, structures and participant groups" (Liew, 2015). These are not universal requirements, but recommendations

that may support the assessment of individual projects. I have grouped the recommendations into four main categories as outlined below:

1. **Promote ease of use**

Ease of use should be encouraged at all stages of the crowdsourcing project. Promoting ease of use encourages new users to contribute, and established users to continue contributing.

Entry barriers should be as low as possible (Liew, 2015), and websites should be accessible on a wide range of device types to increase user engagement. Once users have made the decision to contribute to a project it is important that they encounter a simple and easy to understand description of the crowdsourcing task (Simperl, 2015). Task instructions should be searchable and easy to locate. McKinley recommends that task instructions should be simple but sufficiently detailed to enable users to complete the task efficiently and effectively with minimal effort and minimal error (2012). The perceived cost of participation must remain low, therefore the user interface should be as intuitive, fast and reliable as possible.

2. **Attract and sustain user interest**

Attracting and sustaining user interest over time is a key aspect of successful crowdsourcing projects.

Websites that are attractive, fun to use and responsive can increase enjoyment of the site, as well as visitor expectations about the projects success. This encourages users to engage and contribute to the site. Researchers have pointed to the importance of displaying project progress on the website to sustain user interest (Alam & Campbell, 2017; Causer & Terras, 2014). When data is shared openly it has been found to increase participants trust in the organisation and the project concerned (Liew, 2015). It also contributes to a sense of achievement and encourages users to contribute further.

Gamification is suggested by Brandtner et al (2014) as a useful way to convey a sense of fun and retain user interest. However their research into user motivations suggests that what users consider to be fun is highly subjective. If websites provide task options and choices users can select those tasks that reflect their interest. Targeted content can be useful, providing users with content that they are likely to want to engage with and Holley (2010) suggests that projects can take advantage of current events to retain interest user interest.

3. **Foster a community of users**

Fostering a community of users supports user engagement with the institution and encourages users to contribute. Alam and Campbell found that creating strong sense of community around a crowdsourcing project can create a supportive team dynamic in which users are self motivated (2017, p.756). Community moderation is an option when a community of users has been established. Fostering a community of users in New Zealand may also include supporting Māori and Pasifika communities to engage and express their experiences and points of view.

4. **Show users that their work is contributing to the institution and wider society**

"The goals and underlying purposes of a collaborative project must be clearly presented and communicated to prospective participants, indicating the value and impact of the work and who could benefit from the project" (Liew, 2015).

Presenting reasons to contribute helps visitors to determine the benefits of the project for the institution and wider society. It is important for institutions to convey the credibility of the project to users. Feedback and acknowledgement on successful task completion provides recognition for participation. It's important for users to feel that their contributions are appreciated but also to understand how these contributions will be used and managed.

Table 3: List of design recommendations.

Promote ease of use
1. Provide clear, concise and sufficient task instruction
2. Clearly identify tasks
3. Simplify the task
4. Minimise effort to contribute
5. Provide mobile friendly / responsive design
6. Prioritise key information
7. Minimise user error
Sustain user interest
8. Design is attractive to users
9. Display project progress
10. Convey a sense of fun
11. Provide task options
12. Keep content current
Foster a community of users
13. Convey a sense of community
14. Support community interaction
15. Support content sharing
16. Convey a commitment to biculturalism
17. Enable users to review contributions
18. Support offline interaction
Show users that their work is contributing to the institution and wider society
19. Present reasons to contribute
20. Encourage users to engage with the institutions collection
21. Acknowledge participation
22. Show how project output is freely accessible to the public
23. Convey the credibility of the project
24. Publicly recognise contributions

ii. Additional recommendations

While I found that the majority of the research supports McKinley's findings (see Appendix 3 for citations), I identified some areas that the design principles had not addressed. They are listed as follows:

Support offline interaction

Supporting offline interaction can help publicise the crowdsourcing project and gain buy-in from the wider community. Some institutions supplement their online projects with physical events in the community such as exhibitions of crowdsourced material, workshops and events encouraging people to contribute to the project (Kete Horowhenua, 2007). There are many benefits to this approach. Outcomes of crowdsourcing projects become more visible in the community and as Liew suggests, offline interaction has been found to "reinforce altruistic motivations and participation rates by demonstrating the value of volunteers' work" (2015).

Holley (2010) also suggests that "Many volunteers have low levels of PC proficiency and build up their levels of IT literacy by volunteering for online work". Physical workshops with 'super-users' and staff can help to bring users up to speed with the technology quickly. If the project is able to reach the audience offline, it can be a way to gain support and contributions from users who may not have had access to the project otherwise. Online Cenotaph's outreach project "He Pou Aroha" is an example of a digital project that has been made available offline and brought into community spaces, such as libraries and community centres, and public events.

Examples of compliance with this recommendation may include: Crowdsourced content/output displayed in exhibition spaces, gatherings of digital volunteers in community spaces, workshops and tutorials.

Convey biculturalism

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Cultural heritage institutions worldwide are working towards stronger recognition of the rights of indigenous first peoples. Public cultural heritage institutions in New Zealand have made commitments to biculturalism and to the principles of the Treaty of Waitangi and it is important that they honour these commitments through action. Work towards biculturalism in the cultural sector has been growing momentum since the early 1990s (Lilley, 2013) and is highly relevant today. Auckland Council's 2018 Cultural Heritage Review described "Auckland's unique cultural identity, with Māori and their culture as Auckland's point of difference" (p.12) and highlighted this as a priority area for development. Cultural heritage institutions undertaking crowdsourcing projects could benefit from reflecting this commitment in their crowdsourcing projects and engaging with Māori communities in an authentic way.

Examples of compliance with this recommendation may include: Content in Te Reo Māori, Māori and Pasifika collections highlighted, acknowledgement of Mātauranga Māori/Māori knowledge systems.

Provide mobile friendly / responsive design

Crowdsourcing websites are most effective when they are usable across devices, allowing institutions to reach a broad audience of users. Developments in mobile technology has lead to a growth in mobile web browsing, making flexible, mobile friendly design a requirement for most interactive websites (Gibbs, 2016). Responsive designs respond to changes in width of a browser window by fluidly adjusting the placement of elements on a web page to best fit the available space, while other websites use separate designs for different devices.

Examples of compliance with this recommendation may include: Format of website changes when used on different devices, website elements such as font size, images and layout are optimised for device type.

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9. Results / findings

The results of the content analysis are displayed below through a quantitative representation of the findings in the form of bar charts and tables as well as through textual descriptions and analysis, with supporting visual examples from the texts.

An section of the descriptive codebook, including notes and examples taken from websites reviewed can be referred to in Appendix 5. The table below represents a simplified version of these results. In this table the letter Y indicates compliance with the corresponding recommendation, P indicates partial compliance with the corresponding recommendation and N indicates those projects that have not achieved compliance with the corresponding recommendation.

Table Four: Simplified results showing score of each crowdsourcing project surveyed.

Code: Y = Achieved, P= Partially achieved, N= Not achieved

	Manawatū Heritage	Online Cenotaph	Recollect: Upper Hutt City Libraries Heritage Collections	Discovery Wall	Digital NZ Stories	Measuring the Anzacs	William Ockleford Oldman Archive research materials	Hudson Registers	Scattered Seeds, He Purapura Marara	G.R. Macdonald Dictionary of Canterbury Biographies.	Kete Horowhenua	Kete New Plymouth
Promote ease of use												
1. Provide clear, concise and sufficient task instruction	N	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N
2. Clearly identify tasks	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y
3. Simplify the task	Y	Y	Y	Y	Y	Y	N	P	Y	Y	N	N
4. Minimise effort to contribute	Y	P	Y	Y	Y	P	P	N	Y	Y	Y	Y

5. Provide mobile friendly / Responsive design	P	Y	N	P	P	Y	N	Y	N	Y	N	N
6. Prioritise key information	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y
7. Minimise user error	Y	Y	Y	Y	Y	P	Y	P	Y	Y	P	P
Sustain user interest												
8. Design is attractive to users	Y	P	Y	Y	Y	P	N	P	N	Y	N	P
9. Display project progress	N	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y
10. Convey a sense of fun	P	N	Y	Y	Y	N	Y	Y	N	N	N	N
11. Provide task options	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
12. Keep content current	P	Y	Y	P	N	Y	Y	N	Y	N	Y	Y
Foster a community of users												
13. Convey a sense of community	N	Y	P	Y	Y	Y	Y	N	Y	Y	Y	Y
14. Support community interaction	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
15. Support content sharing	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	Y
16. Convey a commitment to biculturalism	Y	Y	N	N	P	N	N	N	N	N	N	N
17. Enable users to review contributions	N	Y	N	Y	N	N	Y	N	N	N	Y	Y
18. Support offline interaction	N	Y	Y	Y	N	Y	N	N	Y	N	N	N
Show users that their work is contributing to the institution and wider society												
19. Present reasons to contribute	P	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y
20. Encourage users to engage with the institutions collection	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	Y

21. Acknowledge participation	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N
22. Show how project output is freely accessible to the public	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
23. Convey the credibility of the project	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
24. Publicly recognise contributions	N	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y

Of the twelve projects surveyed 7 (58.3%) of the projects were associated with libraries, and five (41.6%) were associated with museums. Notably the Measuring the Anzacs project was a collaboration between The University of Minnesota, Archives New Zealand and Auckland War Memorial Museum and was the only archive affiliated project included in the study. The William Ockleman Oldman Archive Research Materials project was another international project which was based on a collaboration between Te Papa Tongarewa and the National Museum of the American Indian, via The Smithsonian Institution. The G.R. Macdonald Dictionary of Canterbury Biographies project was a collaborative project developed by Canterbury Museum and the University of Canterbury.

Projects were given a score according to their compliance with the 24 design recommendations. The average (mean) score for library projects was 16.57, while the average score for museum projects was slightly higher at 17. Measuring the Anzacs was the only project associated with an archive and it received a score of 16.5.

Table Five: Table displaying basic project details and their relative scores.

Crowdsourcing project	Institution type	Year launched	Achieved	Not Achieved	Partially Achieved	Evaluative Score
Online Cenotaph (Auckland War Memorial Museum)	Museum	2015	21	1	2	21.5
Discovery Wall (Christchurch City Libraries)	Library	2018	18	4	2	19

William Ockleford Oldman Archive Research Materials (Te Papa Tongarewa, National Museum of the American Indian, The Smithsonian Institution)	Museum	2018	18	5	1	18.5
Scattered Seeds, He Purapura Marara (Dunedin Public Libraries)	Library	2011	18	6		18
Recollect: Upper Hutt City Libraries Heritage Collections (Upper Hutt City Library)	Library	2012	17	6	1	17.5
Measuring the Anzacs (Auckland War Memorial Museum, Archives New Zealand, University of Minnesota)	Museum /Archives	2015	14	5	5	16.5
Digital NZ Stories (Digital NZ - National Library of New Zealand)	Library	2017	15	7	2	16
G.R. Macdonald Dictionary of Canterbury Biographies (Canterbury Museum, University of Canterbury)	Museum	2019	16	8		16
Kete New Plymouth (Puke Ariki)	Museum /Library	2009	15	7	2	16
Manawatū Heritage (Palmerston North City Library)	Library	2016	13	7	4	15
Kete Horowhenua (Horowhenua Public Libraries)	Library	2007	14	9	1	14.5
Hudson Registers (Te Papa Tongarewa)	Museum	2018	11	10	3	12.5

Table six: Table displaying project scores by category.

	Digital NZ Stories	Discovery Wall	G.R. Macdonald Dictionary of Canterbury Biographies.	Hudson Registers	Kete Horowhenua	Kete New Plymouth	Manawatu Heritage	Measuring the Anzacs	Online Cenotaph	RECOLLECT: Upper Hutt City Libraries Heritage Collections	Scattered Seeds, He Purapura Marara	William Ockleford Oldman Archive research materials
Promote ease of use	6.5	4.5	7	3	2.5	3.5	4.5	6	6.5	5	6	4.5
Sustain user interest	2	3.5	2	2.5	3	3.5	3	3.5	3.5	5	3	4
Foster a community of users	3.5	5	3	1	4	4	3	3.5	5.5	3.5	4	4
Show users that their work is contributing to the institution and wider society	4	6	4	6	5	5	4.5	3.5	6	4	5	6
Total	16	19	16	12.5	14.5	16	15	16.5	21.5	17.5	18	18.5

i. Projects displaying high levels of compliance with recommendations

Auckland War Memorial Museum's Online Cenotaph project was found to comply with 20 of the 24 requirements, and partially comply with 3 of the requirements. This left the project with an overall score of 21.5. Online Cenotaph outperformed the other projects by at least 2.5 points, according to this measure and scored 5 points above the mean score.

Online Cenotaph was the only project to comply with all the recommendations in both category 1 "Foster a community of users" and category 2 "Show users that their work is contributing to the institution and wider society". The only recommendation that Online Cenotaph received a score of Not Achieved for was recommendation 10 "Convey a sense of fun". However it was noted that a sense of fun may not have been an appropriate recommendation for this particular crowdsourcing project.

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Online Cenotaph serves as a digital memorial for New Zealanders who served in international conflict. Because the website deals with information about people's family members and sensitive information taken from military files, a sense of fun may not have been appropriate in the context of the site.

Other projects that received high rates of compliance were Christchurch City Libraries' Discovery Wall project and the William Ockleford Oldman Archive research Materials project (Te Papa Tongarewa, National Museum of the American Indian, The Smithsonian Institution), both developed in 2018.

The Discovery Wall project was found to comply with 18 of the 24 requirements, and partially comply with two of the requirements. This left the project with an overall score of 19. Discovery Wall was an innovative project developed by Christchurch City Libraries that was available to the public online, onsite in the Christchurch Central Library as well as in the community via a smaller "mobile discovery wall" that travelled to local libraries, schools and rest homes in the community. The website is simple to use and provides multiple task options. It conveys a sense of fun with playful graphics, animation, and video messages that can be added to the database via a large touch screen located in Christchurch Central Library. Though the Discovery Wall project gained points for its attractive visual appearance, and did particularly well at complying with categories 3 and 4 "Foster a community of users" and "Show users that their work is contributing to the institution and wider society" it lost points for not clearly identifying tasks or prioritising key information on the site.

The William Ockleford Oldman Archive Research Materials project was hosted on the Smithsonian Institution's Transcription Centre, so followed the format of the other projects on the website. In comparison to the Discovery Wall project the style of the Oldman Project was simpler and less attractive, however it was clearly and logically laid out, featuring progress updates and clear step by step instructions. The project complied with 18 of the 24 requirements, and partially complied with 1 of the requirements, receiving an overall score of 18.5.

ii. Projects displaying low levels of compliance with recommendations

The project that complied with the least number of recommendations was Te Papa's Hudson Registers project. This was one of two crowdsourcing projects developed by Te Papa in 2018. While Te Papa's William Ockleford Oldman Archive Research Materials project received a score of 18.5, placing it as one of the top three most compliant projects, the Hudson Registers project received a score of 12.5. It was given a score of Achieved for 10 recommendations, Not Achieved for 11 recommendations and Partially Achieved for 3 recommendations. Though both of Te Papa's transcription projects had similar goals, similar subject matter and both were launched in 2018, they were made available on different platforms. The William Ockleford Oldman Archive project was hosted on the Smithsonian Transcription Centre, and had the support of the National Museum of the American Indian (NMAI) and the Smithsonian Institution. The Smithsonian's transcription centre has hosted over 3,000 projects from fifteen participating museums, archives and libraries (Smithsonian Institution, 2019). In contrast, the Hudson Registers project was a small scale project developed by Te Papa staff that was accessed via blog posts, email and a Google Sheets spreadsheet.

Project information was available on Te Papa's blog, and interested users were required to email the project coordinator for further information. Once users received the instructions and project spreadsheet via email they could begin transcription. The blog post format was useful in conveying information about the project and the project complied with all of the recommendations in category 4 "Show users that their work is contributing to the institution and wider society". However the project achieved lower scores for categories 1-3. Key issues were: Users had to wait for an email response from the administrator to get started on the project. The transcription task was complex and required the user to comply with a number of standards. The spreadsheet format used did not allow for customisation or community interaction.

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Horowhenua Library's Kete Horowhenua project scored 14.5, making it one of the least compliant projects. Kete Horowhenua launched in 2007 when crowdsourcing was still a relatively new concept in the GLAM sector, only one year after Jeff Howe coined the term 'crowdsourcing' (2006). As one of the first projects of its kind it was remarkable, and the longevity of the project indicates that the project has been successful. However, the project did not achieve compliance with a number of recommendations in category 1 "Promote ease of use".

Kete New Plymouth scored higher than Kete Horowhenua, despite both projects using the same software developed by the Kete Horowhenua team. Kete New Plymouth achieved partial compliance for recommendation 8 "Design is attractive to users" where Kete Horowhenua received a rating of Not Achieved. Kete New Plymouth also complied with recommendation 6. "Prioritise key information" as it included key information on the project home page, including a call for action, while Kete Horowhenua did not. I suggest that both of these projects could benefit from further assessment of the website design if the projects are to continue.

iii. Break down of results into categories.

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Category 1. Promote ease of use.
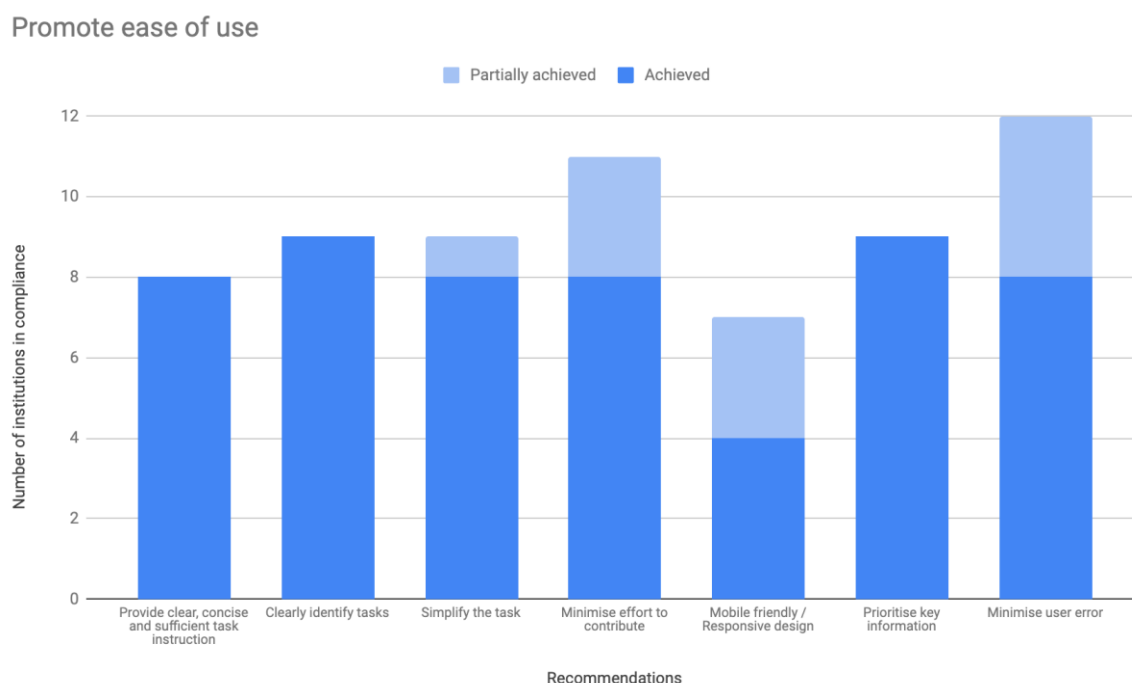
Promote ease of use

Figure 2. Bar graph depicting project compliance with category 1.

There was relatively high compliance with this category. Six of the seven recommendations were complied with by at least two thirds of the projects surveyed.

The G.R. Macdonald Dictionary of Canterbury Biographies project complied with all seven of the requirements in this category. The Hudson Records project complied with the least number of projects in this category, fully complying with only two of the seven recommendations.

Recommendations 1 - 7:

1. Provide clear, concise and sufficient task instruction

8 of the 12 projects (66.66%) complied with this recommendation and one third of the projects did not comply. Many of the projects that displayed compliance with this recommendation used step-by-step instructions and/or training modules to support new users (Digital NZ Stories, Measuring the Anzacs, William Ockleford Oldman Archive Research Materials, Scattered Seeds, G.R. Macdonald Dictionary of Canterbury Biographies). Projects that featured clear Help pages and/or provided

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Frequently Asked Questions pages also displayed compliance. Projects that were given a score of Not Achieved for this recommendation generally featured task instruction that was overly complicated and/or task instruction that was spread across a number of pages. Both Kete projects received a score of Not Achieved for this recommendation as task instruction was long and detailed, spanning multiple pages.

2. Clearly identify tasks

9 out of 12 projects (75%) complied with this recommendation. Projects that displayed compliance with this recommendation generally featured a clear call to action. Tasks were displayed prominently on the homepage of the website. The websites that received a score of Not Achieved for this recommendation lacked contextual information and/or task information was not easily accessible (Discovery Wall, Recollect: Upper Hutt City Libraries, Hudson Registers). These projects required more effort on the user's part to search out crowdsourcing tasks, potentially discouraging users from contributing.

3. Simplify the task

8 out of 12 (66.66%) projects complied and 1 project partially complied with this recommendation. The projects that complied with this recommendation did so by dividing tasks into smaller steps, providing easy to manage data entry fields, and providing drop down options for repetitive fields. Projects that did not simplify the crowdsourcing task, such as the William Ockleford Oldman Archive Research Materials, risked discouraging users from contributing.
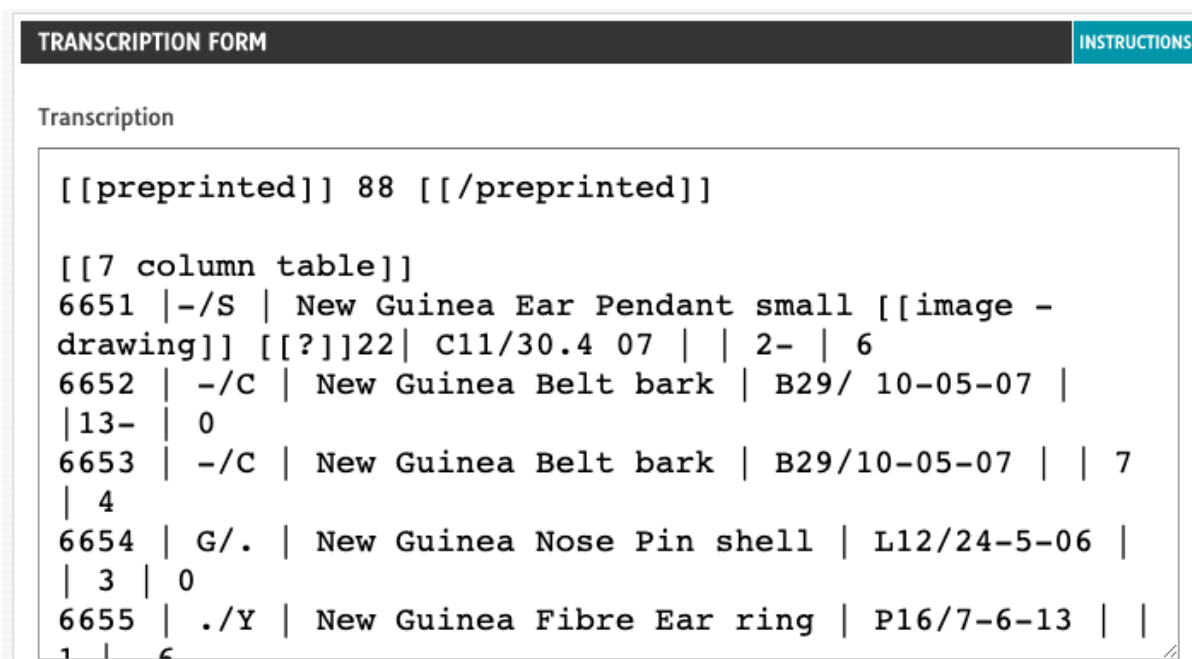
Figure 3. The William Ockleford Oldman Archive Research Materials project requires users to comply with a number of complex transcription standards.

4. Minimise effort to contribute

8 out of 12 (66.66%) projects complied and 3 projects partially complied with this recommendation.
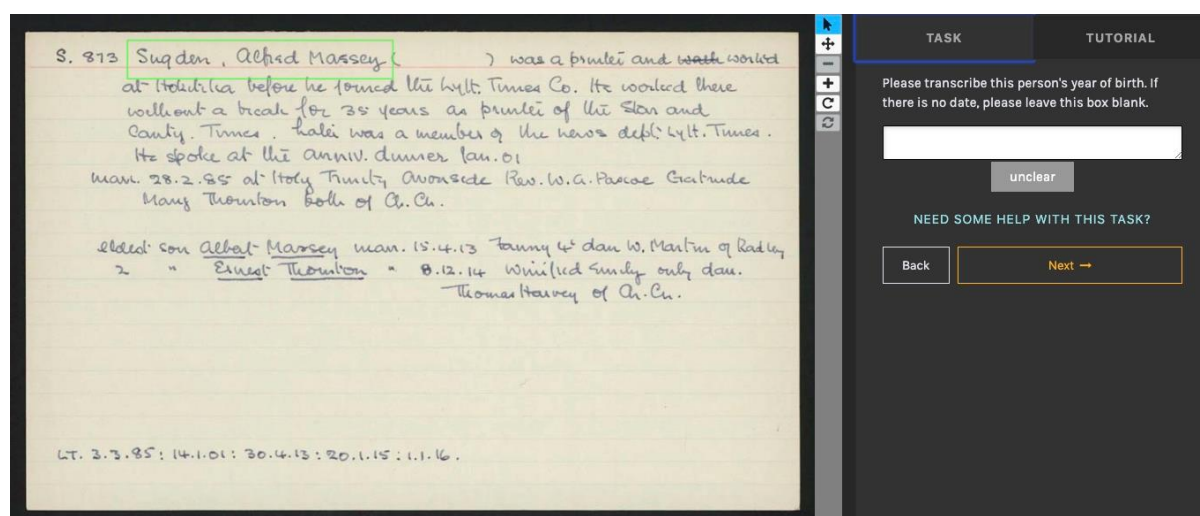
Figure 4. The G. R. Macdonald Dictionary of Canterbury Biographies project minimises effort to contribute by asking users to transcribe key pieces of information rather than the entire text.

The Hudson Registers was the only project to receive a rating of Not Achieved for this recommendation. Users were required to email the project administrator for more information about how contribute to the project and had to wait for an email response from the administrator to get started. This had the potential to discourage users from contributing to the site.

5. Mobile friendly / responsive design

Only 4 of the projects (33.33%) complied with this recommendation and one quarter of the projects (25%) partially complied with this recommendation. This recommendation had the lowest level of compliance of all seven recommendations in category 1. Many of the projects could be viewed on mobile devices but were not fully functional, so received a score of Partially Achieved. The projects that fully complied with this recommendation were The G.R. Macdonald Dictionary of Canterbury Biographies, Online Cenotaph, Hudson Registers and Measuring the Anzacs. When viewed on a mobile device these websites were clear and easy to use as well as fully functional. All of these projects were launched in the last five years, reflecting the increased focus on mobile technology in recent years.
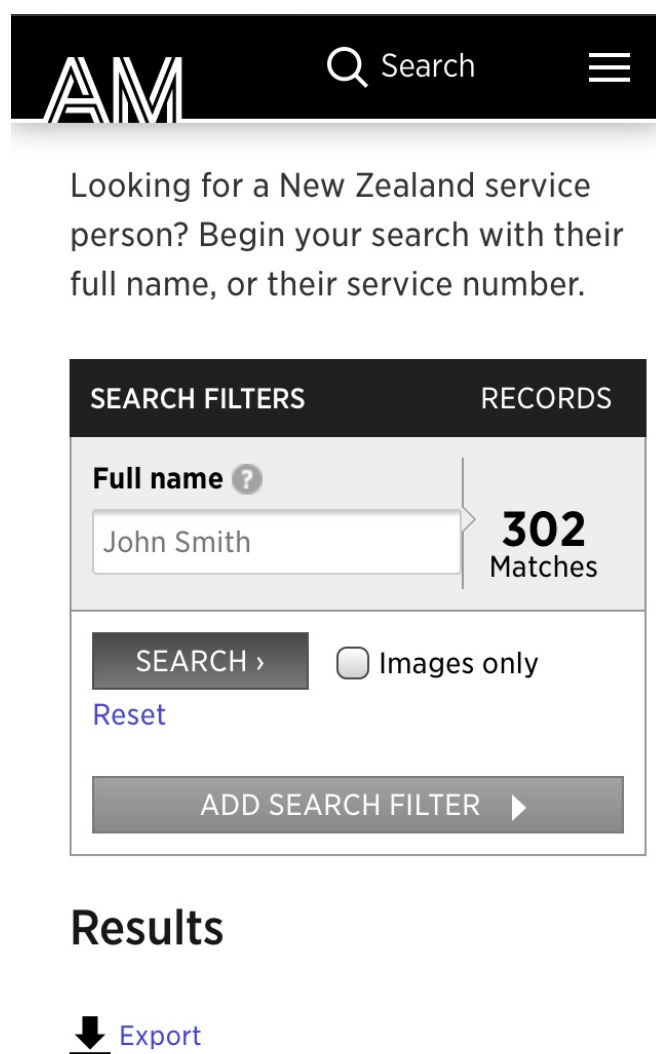
Figure 5. Online Cenotaph's mobile user interface, displaying a simplified design suitable for a smaller screen.

6. Prioritise key information

9 out of 12 (75%) of projects complied with this recommendation. Most of the projects reviewed prioritised key information such as task instruction, project statistics and information about the background of the project, and placed this information prominently on the front page of their websites. The three projects that did not comply with this recommendation (Discovery Wall, Kete Horowhenua, Manawatū Heritage) had issues with the placement of key information. Links to information such as the "about" and "using the site" pages were placed at the bottom

of the home page or on secondary pages that were not immediately accessible to users.
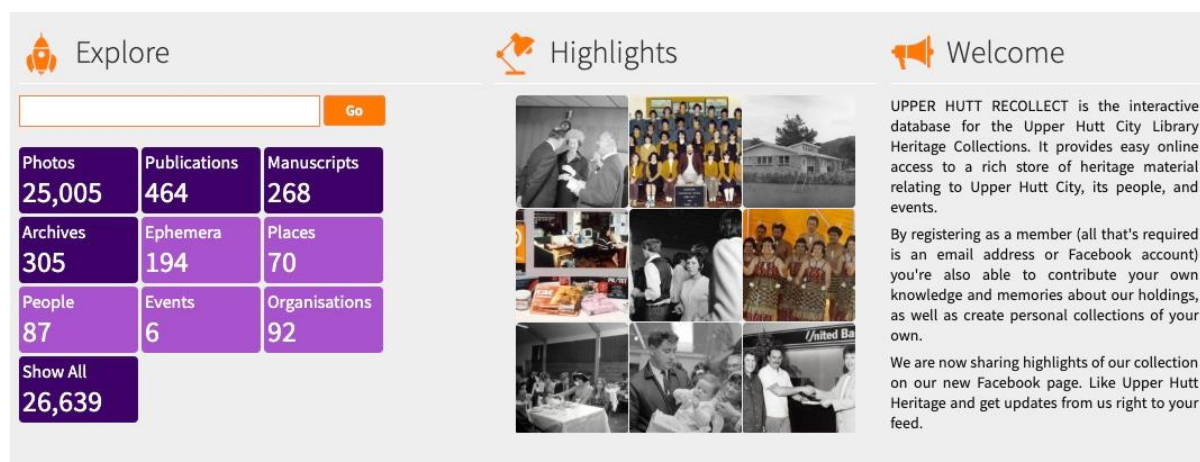
Figure 6. Upper Hutt City Library's Recollect site features a call to action, project statistics and a search bar directly on the front page of the site.

7. Minimise user error

8 out of 12 (66.66%) projects complied and 4 out of 12 (33.33%) projects partially complied with this recommendation. User errors were minimised using processes such as error messages and highlighting missing fields. In most cases incorrectly spelt words were underlined in red to alert users, however Māori words were marked as incorrect in all cases where a spell check functionality was used. There were no examples of noncompliance with this recommendation.

Category 2. Sustain user interest.
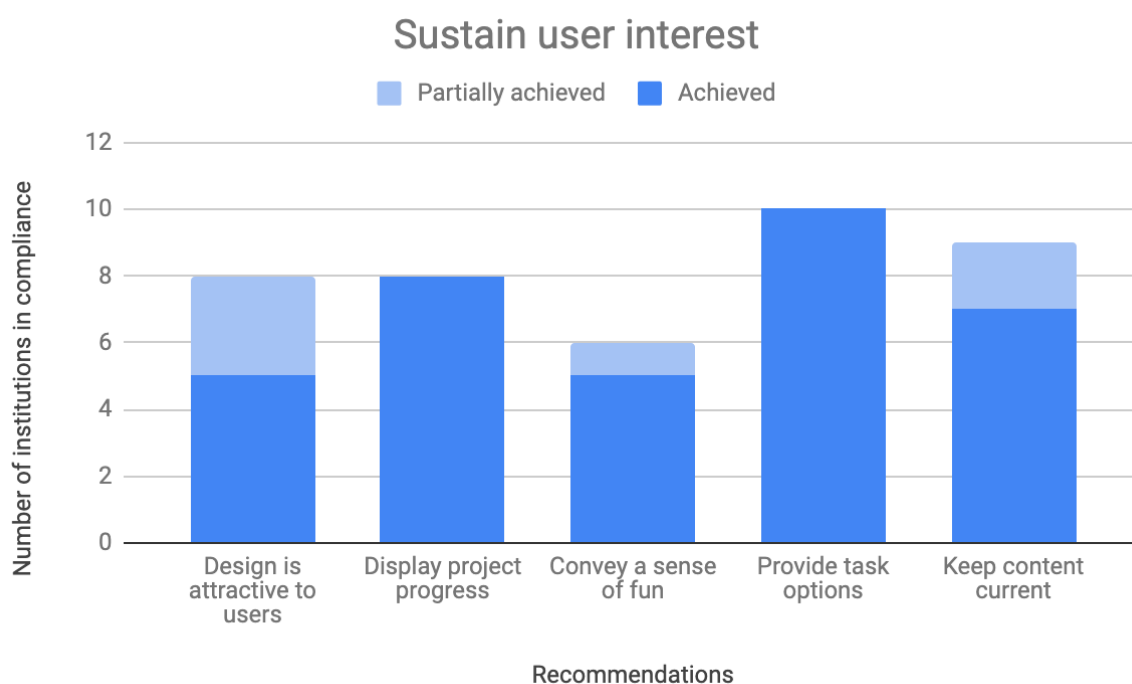
Figure 7 . Bar graph depicting project compliance with category 2.

The Upper Hutt CIty Library's Recollect project was the only project to display compliance with all 5 recommendations in this category.

Digital NZ Stories and the G.R. Macdonald Dictionary of Canterbury Biographies received the lowest scores for this category, both complying with only two of the five recommendations.

8. Design is attractive to users

5 out of 12 (41.66%) projects complied with this recommendation and 3 out of 12 (25%) projects partially complied. Though this recommendation can be subjective, there are some general web design principles that were used to assess the projects. Projects that achieved compliance with this recommendation generally displayed: Clean and uncluttered design, Judicious use of space, A cohesive colour scheme, and plenty of images. Some of the older projects featured design that was somewhat dated and this had an impact on their scores. The Scattered Seeds Project received

a rating of Not Achieved as many of the images on the site were not properly formatted giving them a warped appearance. The layout of the website lacked balance and the combination of colour scheme, graphics and font choice appeared dated and unattractive. Kete Horowhenua's website also was given a rating of Not Achieved as it used few images, illogical use of colour and multiple typefaces giving the site a disjointed feel.

9. Display project progress

8 out of 12 (66.66%) projects complied with this recommendation. Progress bars, user statistics, and charts were featured on compliant websites to document project progress. The projects that did not comply with this recommendation had no indication of project progress on their websites (Digital NZ Stories, Discovery Wall, Hudson Registers, Manawatū Heritage). Some project such as Discovery Wall and Digital NZ stories may not have a fixed project goal to reach, therefore progress bars are not an option for their sites. Reporting of project statistics is recommended as it provides evidence of activity and progress and contributes to an expectation of project success, as well as contributing to a sense of achievement. All of this can encourage users to contribute more to the project (McKinley, 2015).

Figure 8. Progress statistics are visible on the homepage of Online Cenotaph listing the number of images and notes and details added to the site as well as digital poppies laid.

10. Convey a sense of fun

 5 out of 12 (41.66%) projects complied with this recommendation and 1 project partially complied. The projects that successfully conveyed a sense of fun used language, colour and imagery to do so. Christchurch City Libraries Discovery Wall project made use of a number of techniques to convey a sense of fun with its colourful animated scrapbook style imagery on the homepage and use of animation to communicate information. While half of the projects did not comply with this recommendation, a sense of fun was not always appropriate in sensitive contexts, for example in the case of the Measuring the Anzacs and Online Cenotaph projects.

Figure 9. The interactive banner on the homepage of discoverywall.nz.

11. Provide task options

10 out of 12 (83.33%) projects complied with this recommendation. The majority of the projects involving user contributions allowed users to contribute in various formats. Some of the transcription projects allowed users the option to transcribe information or to review other's transcriptions (G.R. MacDonald Dictionary of Canterbury Biographies). Some volunteers like to be able to choose subjects, and types of work they do and others prefer to be directed to what to do next. Providing options can support both types of volunteers (Holley, 2010).
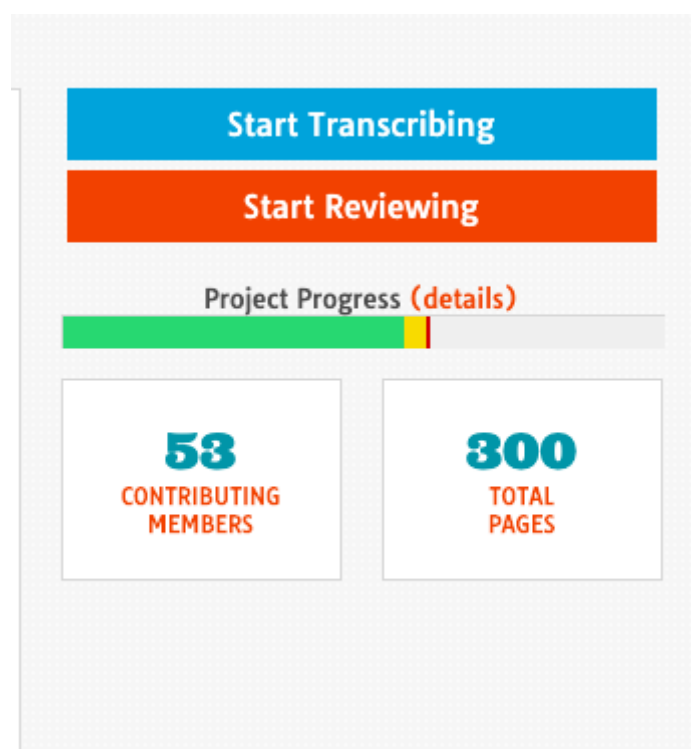
Figure 10. Links to task options displayed alongside project progress bar and contribution statistics on The G.R. Macdonald Dictionary of Canterbury Biographies website.

12. Keep content current

7 out of 12 (58.33%) projects complied with this recommendation and 2 projects (16.66%) partially complied. Projects which complied with this recommendation generally published content online immediately after it was contributed (Online Cenotaph, William Ockleford Oldman Archive Research Materials, Kete Horowhenua and Kete New Plymouth). Projects that allowed content to be sorted by date uploaded and date created also scored highly in this recommendation (Manawatū Heritage, Recollect: Upper Hutt City Libraries, Discovery Wall, Scattered Seeds, He Purapura Marara, Kete New Plymouth). Frequent project updates and blog posts were also examples of compliance with this recommendation. For those websites that received a score of Not Achieved, contributions were not immediately accessible, and it was not clear where users may find recently contributed content.
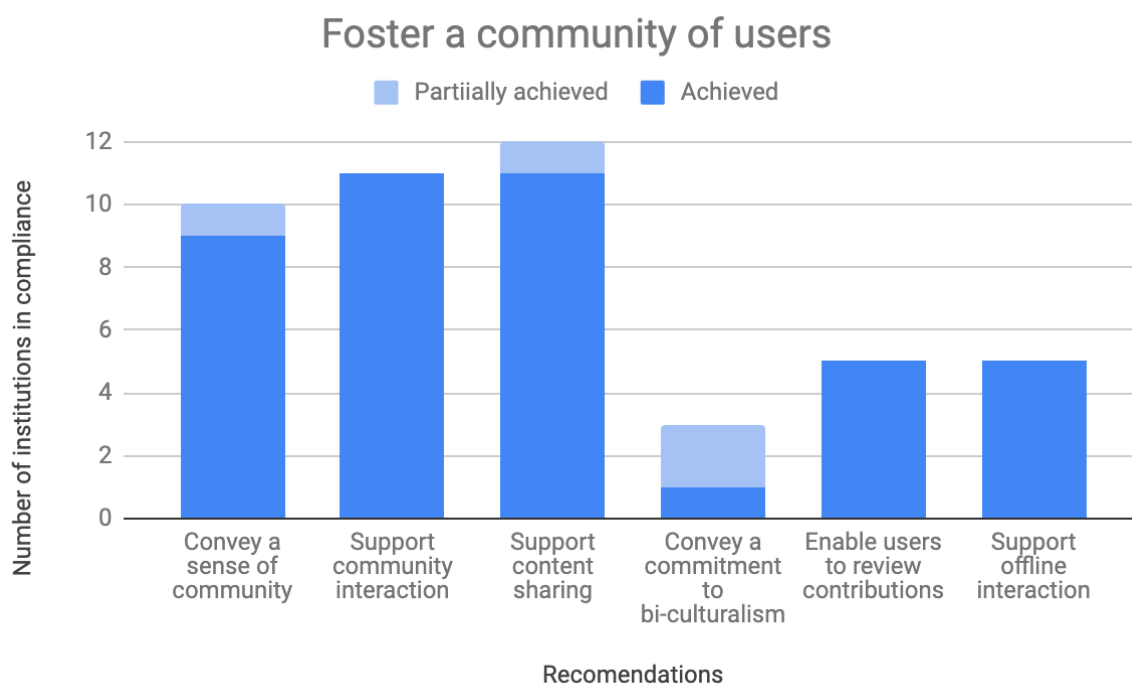
Category 3. Foster a community of users.

Figure 11 . Bar graph depicting project compliance with category 3.

This was the least complied with of the four categories. Recommendations 16, 17 and 18 had the lowest scores of compliance of all 24 recommendations.

Online Cenotaph was the only project to display compliance with all 6 recommendations in this category.

13. Convey a sense of community

9 out of 12 (75%) projects complied and 1 project partially complied with this recommendation. A sense of community was created through a broad range of approaches. Measuring the Anzacs conveyed a sense of community through progress updates and community announcements that were frequently posted on the project's social media accounts and discussion boards. Digital NZ's website featured a series of examples of public contributions by local artists and performers titled "Creative people make creative Stories". Using other contributors as examples can be a key way to encourage users to contribute rich information. Online Cenotaph

features a "Cenotaph Stories" section of the website that contains content by and about users of the website.

NEED SOME INSPIRATION?

You could:

- Create a Story of your favourite pet portraits
- Collate a Story for your class to use in a media studies assignment.
- Share some hair style inspiration with your friends.
- Or pull together great ideas for your interior design project.

Also check out our special series 'Creative people make creative Stories'

- Poet and artist **Gregory O'Brien** made this Story about the Kermadec Islands.
- Electro-pop musician **Princess Chelsea** made us a Story of wonderful princesses.
- Poet **Hera Lindsay Bird** captured sad people from history in this Story.
- Writer **Ashleigh Young** made this Story about people "seeking".
- Musician **Lawrence Arabia** made us a Story of NZ politicians at leisure.
- Curator, writer, and arts administrator **Ema Tavola** made this Story about Oceania in Aotearoa.
- Filmmaker **Taika Waititi** used DigitalNZ to research a project entitled, Shadows.

Figure 12: Examples of how others have contributed to the project are available on Digital NZ's website.

14. Support community interaction

11 out of 12 (91.66%) projects complied with this recommendation. Holley's study suggests that fostering a strong sense of community amongst volunteers can help to build a dynamic, supportive team environment, which in turn promotes user engagement and contributions. Most of the projects surveyed did this through providing comment functionality (Manawatū Heritage, Discovery Wall, Scattered Seeds, He Purapura Marara, Kete Horowhenua, Kete New Plymouth) or providing forums where users could discuss the project (G.R. Macdonald Dictionary of Canterbury Biographies, Measuring the Anzacs). Digital NZ Stories, William Ockleford Oldman Archive research materials and Measuring the Anzacs encouraged contributors to interact using social media.

15. Support content sharing

11 out of 12 (91.66%) projects complied with this recommendation and 1 project partially complied. Making collections and project outcomes shareable can encourage wider engagement with institution's collections, as well as encourage new users to contribute to the site. The majority of the projects surveyed complied with this recommendation by integrating social sharing buttons into their websites. Links to email and social media sites were made available below or alongside content to encourage content sharing (Manawatū Heritage, Online Cenotaph, Recollect: Upper Hutt City Libraries Heritage Collections, Discovery Wall, Digital NZ Stories, William Ockleford Oldman Archive Research Materials, Hudson Registers, Scattered Seeds, He Purapura Marara). Half of the projects also supplied copyright information for each record (Manawatū Heritage, Discovery Wall, Scattered Seeds, He Purapura Marara, G.R. Macdonald Dictionary of Canterbury Biographies, Kete Horowhenua, Kete New Plymouth).

Source: The New Zealand traveller Christmas number 1930
Reference ID: CCL-KPCD09-IMG0041
Uploaded by: Christchurch City Libraries
Copyright status: In copyright
This material has been provided for private study purposes (such as school projects, family and local history research) and any published reproduction (print or electronic) may infringe copyright law. Please contact Christchurch City Libraries if you have any questions relating to the use of this material. It is the responsibility of the user to obtain clearance from the copyright holder.

Contact us about this

Figure 13: Copyright information and social sharing buttons provided at the bottom of a record on the Discovery Wall website.

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Hall-McCaul House, 181 Kairau Road East (1882)

Topic » Place » Building

Tags

Tags: 181 Kairau Road East, Hall-McCaul House, WB_Pre 1900, WB_Kairau Road East, Benjamin Hall

This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 New Zealand License.

2019 View: By Hamish Crimp

Figure 14. Creative Commons copyright information displayed alongside a record on the Kete New Plymouth website.

16. Convey a commitment to biculturalism

1 out of 12 (8.33%) projects complied with this recommendation and 2 projects (16.66%) partially complied. This recommendation was the least complied with of all 24 recommendations. The only project that successfully conveyed a commitment to biculturalism was Manawatū Heritage. Navigation of the site can be accessed in English and Te Reo Māori, the 'about' section of the site is available in English and Te Reo Māori, and Items can be uploaded by the public in any language (Manawatū Heritage). Online Cenotaph and Digital NZ stories received a rating of partially complied as they featured Māori content, and encouraged contributions of Māori material but did not display full commitment.
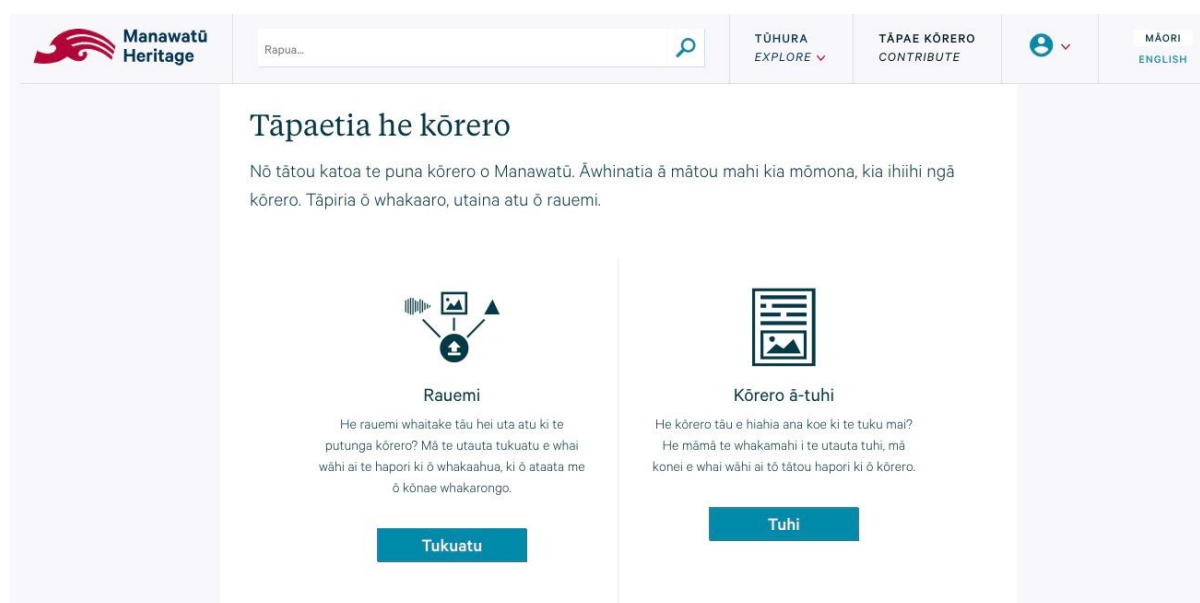
Figure 15: The Manawatū Heritage website can be accessed in English or Te Reo Māori.

17. Enable users to review contributions

5 out of 12 (41.66%) projects complied with this recommendation. McKinley suggests that "Reviewing other contributors' work promotes a sense of community, and contributors concerned about accuracy are reassured that their work will be reviewed" (2015). Online Cenotaph and Discovery Wall allow users to 'report' incorrect material once it has been published, and William Ockleford Oldman Archive research materials users are asked to review transcriptions for errors before they are passed on to the project team. The Kete projects give users an even higher level of control over contributions by allowing topic pages to be edited by an registered user.

18. Support offline interaction

5 out of 12 (41.66%) projects complied with this recommendation.
Opening up projects to offline users allows more of the community to engage with the project, and increases their ability to contribute. The Online Cenotaph and Scattered seeds projects provided face to face support for contributors and Online Cenotaph's He Pou Aroha project brought the Online Cenotaph database out into

public spaces such as community events, libraries and rest homes. Similarly the Discovery Wall project involved onsite, online, and satellite projects.

Category 4. Show users that their work is contributing to the institution and wider society.
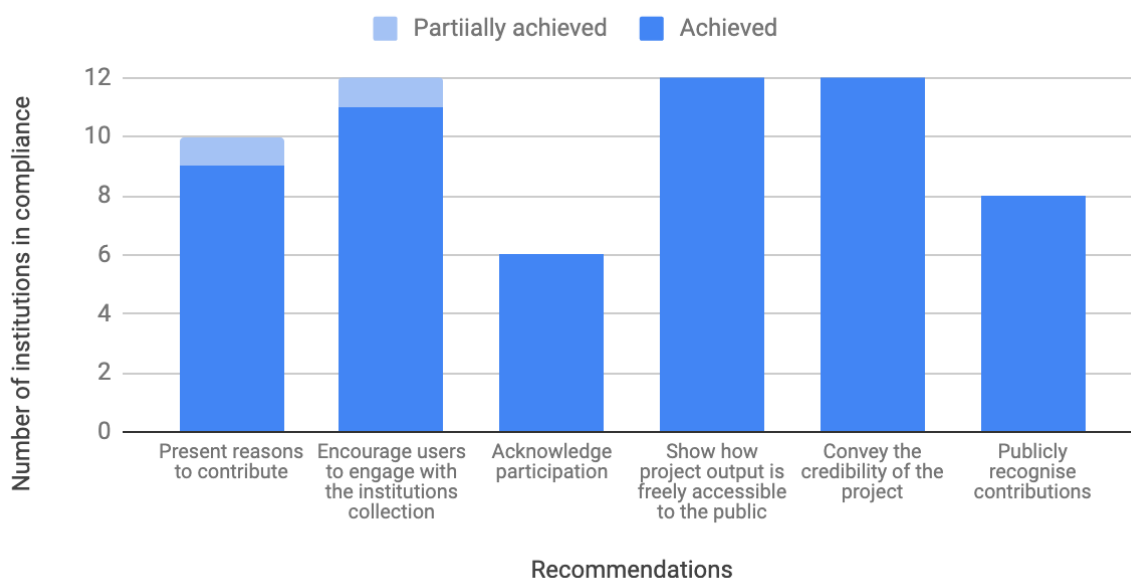
Figure 16 . Bar graph depicting project compliance with category 4.

Overall the 12 projects surveyed were relatively successful at achieving compliance with this category and all of the projects complied with at least half of the recommendations in this category. The two recommendations that were universally complied with by all twelve projects were recommendation 22 "Show how project output is freely accessible to the public" and recommendation 23 "Convey the credibility of the project".

Auckland Museum's Online Cenotaph project and both of Te Papa's projects complied with all 6 of the recommendations in this section.

19. Present reasons to contribute

9 out of 12 (75%) projects complied and 1 project partially complied with this recommendation. Projects conveyed the value in participating in the project though listing project goals on the website, as well as potential benefits of the project. When providing reasons to contribute, institutions focused on expressing how the project could improve their collections and benefit the community.

20. Encourage users to engage with the institution's collection

11 out of 12 (91.66%) projects complied and 1 project partially complied with this recommendation. A key part of cultural heritage institutions mandate is promoting their collections and making them accessible to users. The majority of the websites featured images of collection items on their homepages and image slideshows to encourage people using the website to engage with different parts of the collection. Measuring the Anzacs partially complied with this recommendation, as users could access partial records but could not browse collection items in their entirety in the current iteration of the website.

21. Acknowledge participation

6 out of 12 (50%) projects complied with this recommendation. Most of the projects that did comply provided messages of acknowledgement to contributors by including a 'Thank you' message as an automatic response to contributions (Manawatu Heritage, Online Cenotaph, Recollect: Upper Hutt City Libraries Heritage Collections, Discovery Wall, William Ockleford Oldman Archive Research Materials). The Hudson Registers project team informed users that they would be named and thanked at the end of the project. Acknowledging participation is a simple gesture on behalf of the institution that lets contributors know that they are valued, motivating them to want to continue contributing. This recommendation was only employed by half of the projects surveyed, indicating that this is an area that could be developed.

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Figure 17: Automatic pop-up response following digital contributions to the Manawatū Heritage project.

22. Show how project output is freely accessible to the public

100% of the projects reviewed complied with this recommendation. Each project website explicitly states that user contributed content will be made public. Some of the websites also made it clear that this information will be made public under a Creative Commons licence (Kete Horowhenua, Kete New Plymouth, Hudson Registers). Conveying the public benefits of a project can encourage users motivated by altruistic or collective motivations to contribute to a meaningful cause (Liew, 2015).

23. Convey the credibility of the project

100% of the projects reviewed complied with this recommendation. Providing information about the aims, purposes and policies of the project supports the credibility of the project and allows potential contributors to see the value in participating in the project. All of the websites provided this information alongside evidence of institutional support.

24 Publicly recognise contributions

8 out of 12 (66.66%) projects complied with this recommendation. Examples of public recognition can be as simple as publishing users names alongside the content they have contributed to (Kete New Plymouth, Kete Horowhenua, Scattered Seeds,

He Purapura Marara, Discovery Wall, Online Cenotaph) or naming and thanking contributors publicly (Hudson Registers). Online Cenotaph recognised high performing contributors in blog posts that were published on the Auckland Museum website. Public recognition can be used as a way to reward high achievers and encourage competition amongst contributors (Holley, 2010).
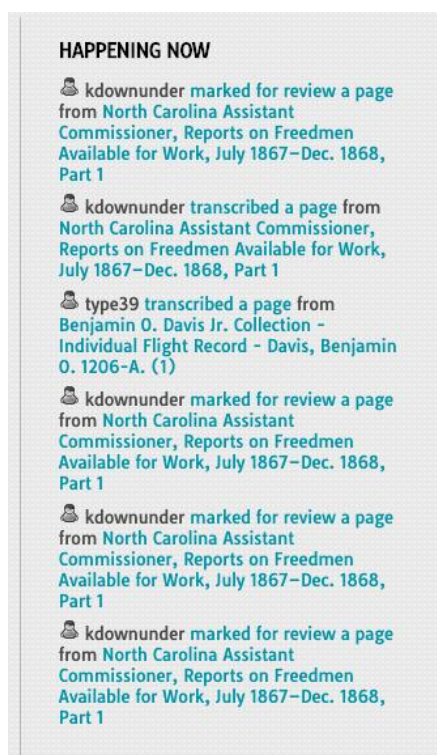
Figure 18: Usernames of recent contributors published on the homepage of the Smithsonian Transcription Centre.

10. Discussion and conclusion.

The purpose of this study was to assess the degree that New Zealand cultural heritage crowdsourcing websites comply with design recommendations that encourage user participation and attract meaningful contributions to their collections. 24 website design recommendations were developed and content analysis allowed for systematic observation of the 12 websites sampled for this study. The sample included websites associated with libraries, museums and one archive. The higher number of libraries identified for inclusion in the study supports research that suggests that libraries have been quick to adopt new technologies and aspects of

interactive web design (Sharma, 2011, p.47). In general archives have been slow to adopt an interactive approach online (Sharma, 2011, p.35) and this was reflected in the results of this study, which identified only one New Zealand crowdsourcing project related to archives. It was anticipated that public art galleries would have been represented in the sample and that a comparative analysis of institution types would have been possible, however, no crowdsourcing projects relating to public art galleries in New Zealand were identified.

The findings contributed to an assessment of New Zealand crowdsourcing projects. The average (mean) score given to library projects was 16.57, while the average score for museum projects was slightly higher at 17. The single archive project studied received a score of 16.5, resulting in the average score for each institution type staying within 0.5 points. This has led to the conclusion that institution types are at a relatively similar level of compliance. A limitation of this study was the small sample size of 12 projects. Had the sample size been larger, a more conclusive argument could have been made.

Compliance with recommendations was higher than was initially expected and nearly all of the projects fully complied with over half of the 24 recommendations. The projects displayed particularly high levels of compliance with the recommendations in category 4 "Show users that their work is contributing to the institution and wider society". All 12 projects achieved the recommendations "Show how project output is freely accessible to the public", "Convey the credibility of the project" and "Encourage users to engage with the institution's collection" from this category. These results suggest that cultural heritage institutions are generally successful at displaying the credibility and worth of their projects and promoting their crowdsourcing projects and collections on their websites. This in turn can potentially lead to sustained engagement and user interaction.

Recommendations 21 "Acknowledge participation" and 24 "Publicly recognise contributions" were not observed by all projects. These recommendations have been shown to noticeably increase user motivation (Holley, 2010), yet require limited effort

on the part of the institution to put in place. Recommendation 17 "Enable users to review contributions" also had low levels of compliance, though this requirement involved more technical aspects of web design, and was likely more challenging for some projects to achieve.

The least complied with recommendation was 16 "Convey a commitment to biculturalism". This recommendation was not one of McKinley's recommendations, however, it was an important recommendation to include in this study considering the importance of biculturalism for New Zealand cultural heritage institutions. Biculturalism in cultural heritage institutions has been an important issue discussed in New Zealand literature (Lilley, 2016) and a number of New Zealand GLAM institutions have made their commitment to biculturalism clear in their institutional documents (Auckland War Memorial Museum, 2016; Christchurch City Libraries, 2012), however this is not always reflected in institutional output. Puawai Cairns described the importance of authentic engagement with biculturalism, stating, "if an institution has adopted biculturalism as its driving framework, it is not enough to only wear it as a temporary face of makeup, it should be carved into its structure, as an irrefutable and undeniable statement" (2018). Although achieving authentic biculturalism is by no means an easy task, engaging with Māori communities and developing content and resources that reflect Māori culture and heritage is a starting point for heritage institutions. A well thought out crowdsourcing project that committed to engaging with bicultural practices would be a welcome addition to the field.

New Zealand's cultural heritage institutions have much to gain from volunteer crowdsourcing whether it be encouraging public engagement, enriching institutional resources or building new resources through public contributions. This research provides suggestions of some of the ways that New Zealand institutions can encourage users to participate in their projects and support these users to produce meaningful contributions. The content analysis section of this report identified some of the areas that crowdsourcing projects were particularly successful in, and also identified some of the shared practical issues that institutions face when facilitating

these types of projects. By employing some of these recommendations, institutions may be able to develop or reinvigorate their crowdsourcing projects and engage meaningfully with their users.

Though these 24 design recommendations are a useful place to start in assessing New Zealand's cultural heritage institution's crowdsourcing projects, they do not address the unique requirements of specific projects and institutions. Future research could employ a case study approach to assess crowdsourcing projects on a case by case basis. This would allow the researcher to examine collecting policies of institutions, as well as conduct interviews with project managers and staff producing these crowdsourcing projects, enabling them to develop a clearer understanding the context surrounding each project.

This research provides recommendations that will help New Zealand GLAM institutions to refine their approaches to digital crowdsourcing and identify projects that may need improvement. I hope that the recommendations will be a useful resource for future project managers and stakeholders interested in developing and evaluating their own crowdsourcing projects.

Word count: 12,811

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13. Appendices

Appendix 1: Cultural heritage crowdsourcing projects referenced in the report:

Australian Newspaper Digitisation Programme
https://www.nla.gov.au/content/newspaper-digitisation-program

The Berry Boys
https://blog.tepapa.govt.nz/2014/04/01/the-berry-boys-wwi-soldier-identification-project-the-story-so-far/

Digital NZ Stories
https://digitalnz.org/stories/5b45cdc9fb002c059cbb7ddb

Discovery Wall
https://discoverywall.nz/

G.R. Macdonald Dictionary of Canterbury Biographies.
https://www.zooniverse.org/projects/christopherthomson/macdonald-dictionary

Hudson Registers
https://blog.tepapa.govt.nz/2018/08/15/help-crack-the-insect-code/

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Kete Horowhenua

http://horowhenua.kete.net.nz/

Kete New Plymouth

http://ketenewplymouth.peoplesnetworknz.info

Lesley Adkins Diaries

https://collections.tepapa.govt.nz/topic/8226

Lives of the First World War

https://livesofthefirstworldwar.org/

Manawatū Heritage

https://manawatuheritage.pncc.govt.nz/

Measuring the Anzacs

https://www.measuringtheanzacs.org/

Native Land Map

https://native-land.ca/

NZ-RED The New Zealand Reading Experience Database, Wai-te-ata Press,
Victoria University of Wellington

https://nzredblog.wordpress.com/nzred/

National Museum of the American Indian Archives Centre - via Smithsonian Digital
Volunteers Transcription Centre

https://transcription.si.edu/browse?filter=owner:15

Online Cenotaph

http://www.aucklandmuseum.com/war-memorial/online-cenotaph

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Scattered Seeds, He Purapura Marara, Dunedin Public Libraries and the Dunedin Lebanese Community

https://dunedin.recollect.co.nz/

Smithsonian Digital Volunteers Transcription Centre

https://transcription.si.edu/

Transcribe Bentham

http://transcribe-bentham.ucl.ac.uk/td/Transcribe_Bentham

Whakamīharo Lindauer Online

http://www.lindaueronline.co.nz/

William Ockleford Oldman Archive research materials

https://blog.tepapa.govt.nz/2018/12/22/help-reconnect-taonga-with-their-communities-and-history/

Commercial crowdsourcing projects referenced in the report:

iStock, Getty images

https://www.istockphoto.com/

Mechanical Turk, Amazon

https://www.mturk.com/

Appendix 2: Websites reviewed

Project title	Institution/key stakeholders	Institution type	Website	Crowdsourcing type	Platform used	Year lauched	History
Digital NZ stories	Digital NZ (National Library of Library)	Library	https://digitalnz.org/stories/5b45cd9fb0022059cbb7ddb	Remixing	Purpose built website	2017	Digital NZ's new website was launched in August 2017. The website features a 'stories' function designed to make the website more interactive. The 'stories' feature allows users to bring together items into groups, and also write text annotations, and resize and reorder content. Stories can be kept private or shared publically on the Digital NZ Website.
Discovery Wall	Christchurch City Libraries	Library	https://discoverywall.nz/	Contributions (images and stories - digital copies)	Purpose built website	2018	The Discovery Wall is a digital exhibition developed by Christchurch City Libraries for the newly refurbished Central Library Tūranga Christchurch. The exhibition uses historical images, videos and documents to tell the stories of the history of Christchurch and is accessible both onsite at the Central Library, at the smaller Mobile Discovery Wall and online on discoverywall.nz. The content displayed on the Discovery Wall is collected from Christchurch City Libraries Digital Heritage collection and appropriate material from other institutions as well as material crowdsourced from uploads by the public. The public are encouraged to contribute images and memories via the website to be displayed and permanently preserved in the collection, as well as post comments and video messages.
G. R. Macdonald Dictionary of Canterbury Biographies.	Canterbury Museum, The University of Canterbury	Museum, Tertiary Institution	https://www.zooniverse.org/projects/christopherthomson/macdonald-dictionary	Transcription and tagging.	Zooniverse	2019	This project is a joint public history project that was brought about by a collaboration between the University of Canterbury and Canterbury Museum. The aim of the project is to bring awareness to the G R MacDonald Dictionary of Canterbury Biography, held by the University of Canterbury and to make it computer searchable. The Canterbury Museum holds over 12000 index cards that contain biographical information taken from the G R Macdonald Dictionary of Canterbury Biography. The index cards have been uploaded onto the crowdsourcing platform Zooniverse and the public are asked to log on to the platform and tag and transcribe names mentioned in the dictionary, prioritising those of women and children. The project was initially trialled in 2017 with a small group of participants from the University of Canterbury, and became publicly available January 2019. One of the project's major benefits is providing better access to information about the women of nineteenth-century Canterbury.
Hudson Registers	Te Papa Tongarewa	Museum	https://blog.tepapa.govt.nz/2018/08/15/help-crack-the-insect-code/	Transcription	Te Papa website and Google sheets	2018	The Hudson Collection is an entomology collection consisting of several thousand insect specimens held by Te Papa Tongarewa. The collection is described in three registers of collection records, that are delicate due to age and no longer able to be handled. These are handwritten and encoded and therefore challenging to capture. In 2018 the registers were scanned and digitised, and an open call was made via Te Papa's website for volunteers to help transcribe the registers. The transcriptions won't have any copyright restrictions and once the transcription is completed, the data will be available to access via Te Papa's Collections Online website.
Kete Horowhenua	Horowhenua Public Libraries	Library	http://horowhenua.kete.net.nz/	Contribution of content	Purpose built website	2007	Kete Horowhenua was one of the first examples of a purpose built crowdsourcing platform produced by a New Zealand heritage institution. Kete was originally developed by the Horowhenua Library Trust and Katipo Communications, Ltd. for the Kete Horowhenua site in 2007. Designed as open repository of digitised content from public institutions the website allowed the public to contribute directly to the collection by uploading media such as images, audio, video, and documents. The website holds information from a variety of public sources, as well as personal histories and content produced by the public. Kete Horowhenua volunteers have contributed to the project by transcribing, proof-reading, researching, indexing, scanning and cataloguing.
Kete New Plymouth	Puke Ariki, APNK Aotearoa People's Network Kaharoa	Library/Museum	http://www.kete.net.nz/showcase/ https://www.youtube.com/watch?v=uUxSThAZkJc	Contribution of content	Kete open source software	2009	Kete was originally developed by the Horowhenua Library Trust and Katipo Communications, Ltd. for the Kete Horowhenua site but has since been developed into a large network with the development of twelve unique Kete belonging to NZ public libraries who are members of APNK Aotearoa People's Network Kaharoa. Described as "An online digital knowledge basket", Kete is open source software that can be used to create and share online. Kete New Plymouth is a repository of digitised content from Puke Ariki, that encourages the public to contribute to topics and upload media such as images, audio, video, and documents.
Manawatū Heritage	Palmerston North City Library	Library	https://manawatuheritage.pncc.govt.nz/	Contribution of content	Purpose built website	2016	Manawatū Heritage is an online repository run by Palmerston North City Library. It showcases holdings from the Ian Matheson City Archives, as well as records and content sourced directly from the community. Users of the website are encourage to search, share, and download thousands of photographs and other items about the Manawatū region as well as contribute their own images and stories to the repository. Digitisation of the Ian Matheson City Archives is ongoing, and new material is continually added to the online collection both by library staff and the public.
Measuring the ANZACs	Archives New Zealand, Auckland War Memorial Museum and University of	Museum, Archive, Teritary	https://www.measuringtheanzacs.				Measuring the ANZAC is a transcription project aiming to collect the key elements from New Zealand WW1 soldier's personnel files to make this information searchable and available to researchers. Archives New Zealand have nearly 4 million pages of digitised personnel files that have been added to the crowdsourcing platform Zooniverse for public transcription. Once complete the transcriptions will be made available online and the data collected will be made available for research purposes. The project is a collaboration between

Project title	Institution/key stakeholders	Institution type	Website	Crowdsourcing type	Platform used	Year lauched	History
Online Cenotaph	Auckland War Memorial Museum	Museum	http://www.aucklandmuseum.com/war-memorial/online-cenotaph	Contribution of content	Purpose built website	2015	Online Cenotaph is a digital memorial to New Zealanders who served in international conflict, coordinated by Auckland War Memorial Museum. It originally began as a database of New Zealand soldiers in 1996, and was relaunched in 2015 as a fully interactive crowdsourcing initiative that combines the official information taken from archives and publications, with personal memories and connections. The database includes information added by staff but relies heavily on contributors who are encouraged to add comments, photographs, or biographical details to service personnel's individual files.
Scattered Seeds, He Purapura Marara	Dunedin Public Library	Library	https://dunedin.recollect.co.nz/	Transcription	Recollect (NZMS)	2011	He Purapura Marara, Scattered Seeds is a digital archive developed by Dunedin Public Libraries and the Dunedin Lebanese Community. It is an 'open archive', a database on the Recollect platform that allows users to search, download, and upload digital content. The website is also the home of the Dunedin Public Libraries index card transcription project. Library staff have digitised 199,000 index cards from 1851-1993 containing information from newspapers and about community groups and uploaded these to the Scattered Seeds Archive. The public are invited to contribute to the transcription of these cards via the Recollect website. Currently about 30% of the cards have been transcribed and these transcriptions will
Upper Hutt City Library RECOLLECT Database	Upper Hutt City Libraries	Library	https://uhcl.recollect.co.nz/	Contribution of content	Recollect (NZMS)	2012	Upper Hutt City Library's Recollect database is a an interactive database that combines crowdsourced data with digitised collection items. It displays the Upper Hutt City Library Heritage collections and provides digital access to heritage material relating to Upper Hutt, but also encourages users to contribute their own knowledge and memories about the area and to contribute digital content to the collection. The website holds a range of formats and users are able to contribute photographs, documents, video and audio.
William Ockleford Oldman Archive Research Materials	Te Papa Tongarewa, National Museum of the American Indian, The Smithsonian Institution	Museums	https://blog.tepapa.govt.nz/2018/12/22/help-reconnect-taonga-with-their-communities-and-history/	Transcription	Smithsonian Transcription Centre	2018	The Oldman Registers public transcription project came about from a collaboration between the National Museum of the American Indian and Te Papa Tongarewa. In 2016 Maria Galban, Collections Documentation Manager at the NMAI, approached Jennifer Twist, Archivist at Te Papa, seeking scanned copies from the WO Oldman business records relating to objects which are now in the NMAI collection. The decision was then made to have these stock books digitised for public access. Seven stock books were identified as containing important information with a total of 2,000 pages, and an opportunity for a public transcription project emerged. Te Papa supplied high quality scans of the papers to the Smithsonian Transcription Centre in 2018 and these are now available online for public transcription. The resulting transcriptions will provide searchability and better access to these records.

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Appendix 3: Coding manual for Research Question Two:

Promote ease of use		
Provide clear, concise and sufficient task instruction		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Instructive graphics, step by step instructions, and frequently asked questions.
Clearly identify tasks		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Clear navigation tools, clear visual prompts identifying tasks, Key tasks prominently located on the front page of the website.
Simplify the task		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this	

	recommendation	
Notes		Examples of compliance may include: Tasks are divided into small, easy to manage sections, user interface is simple and easy to use, tasks are split into distinct data input fields.
Minimise effort to contribute		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Optional registration requirement, site mobility, auto-fill features.
Prioritise key information		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Key information centrally located on the front page of the website, call to action prominently placed on the website.
Minimize user error		
Yes	Record any examples of ways that the website complies with this	

	recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Spell check functionality, informative error messages, a flag or report button.
Sustain user interest		
Design is attractive to users		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Webpage appears clean and uncluttered, aesthetic is consistent with the institution's brand, attractive graphics and visual elements.
Display project progress		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: User statistics available, goals and milestones clearly stated, progress bar visible.
Convey a sense of fun		

Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Games or challenges incorporated into workflow, use of light-hearted or playful language, narrative.
Provide task options		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: A selection of tasks to choose from, different topics or collections available to work on.
Keep content current		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	

Notes		Examples of compliance may include: Regular blog posts or project updates, recently added material prominently visible on the site, notifications when new content has been uploaded, user contributions are published in real-time and immediately searchable.
Foster a community of users		
Convey a sense of community		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Information about project staff, displaying contributor profiles, progress updates and community announcements.
Support community interaction		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Discussion forums, comment functionality, feedback forms, project newsletters.
Support content sharing		
Yes	Record any	

	examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Downloadable content, email and social media sharing functionality.
Convey a commitment to biculturalism		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Content in te reo Maori, Maori and Pasifika collections highlighted, acknowledgement of Matauranga Maori/Māori knowledge systems.
Enable users to review contributions		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Enabling users to correct or enhance other users contributions, enabling users to report incorrect material.

Show users that their work is contributing to the institution and wider society		
Present reasons to contribute		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Descriptions of who will benefit from the project, examples of how project output is being used, explicit discussion of how the work benefits the institution.
Encourage users to engage with the institutions collection		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Image galleries and online exhibitions, personalised lists, articles and blog posts about collections.
Acknowledge participation		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance	

	with this recommendation	
Notes		Examples of compliance may include: Automatic responses to contributions, user statistics available, frequent users are acknowledged as "Super Users".
Show how project output is freely accessible to the public		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Information about public access is available, once submitted content is immediately searchable by the public online.
Convey the credibility of the project		
Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Aims, purposes and policies of the project are accessible, information about the project team is available, institutional support is clearly visible.
Publicly recognise contributions		

Yes	Record any examples of ways that the website complies with this recommendation	
No	Record examples of non-compliance with this recommendation	
Notes		Examples of compliance may include: Leaderboards, blog posts recognising regular contributors, usernames attached to content.

Appendix 4: Citations supporting design recommendations.

Promote ease of use		
1. Provide clear, concise and sufficient task instruction	Cox et al. 2015; Gunther, Schall & Wang, 2016; Liew, 2015; McKinley, 2013; Simperl, 2015	
2. Clearly identify tasks	Gunther, Schall & Wang, 2016; McKinley, 2013.	
3. Simplify the task	Cox et al. 2015; Liew, 2015; McKinley, 2013.	
4. Minimise effort to contribute	Gunther, Schall & Wang, 2016; Holley, 2010; Causer & Terras, 2014; McKinley, 2013.	
5. Mobile friendly / Responsive design	Brandtner, Auinger & Helfert, 2014	
6. Prioritise key information	McKinley, 2013.	
7. Minimise user error	Causer & Terras, 2014; McKinley, 2013.	
Sustain user interest		
8. Design is attractive to users	McKinley, 2013.	
9. Display project progress	Alam & Campbell, 2017; Causer & Terras, 2014; McKinley, 2013.	
10. Convey a sense of fun	Brandtner, Auinger & Helfert, 2014; Holley, 2010; Liew, 2015; McKinley, 2013.	
11. Provide task options	Gunther, Schall & Wang, 2016; Holley, 2010; McKinley, 2013.	
12. Keep content current	Alam & Campbell, 2017; Holley, 2010; McKinley, 2013.	
Foster a community of users		
13. Convey a sense of community	Alam & Campbell, 2017; Cox et al. 2015; Holley, 2010; McKinley, 2013.	
14. Support community interaction	Alam & Campbell, 2017; Brandtner, Auinger & Helfert, 2014; Cox et al. 2015; Holley, 2010; McKinley, 2013.	
15. Support content sharing	Alam & Campbell, 2017; Gunther, Schall & Wang, 2016; McKinley, 2013.	
16. Convey a commitment to biculturalism	Auckland Council, 2018.	
17. Enable users to review contributions	Alam & Campbell, 2017; Gunther, Schall & Wang, 2016; McKinley, 2013.	
18. Support offline interaction	Cox et al. 2015; Liew, 2015	
Show users that their work is contributing to the institution and wider society		
19. Present reasons to contribute	Holley, 2010; Liew 2015; McKinley, 2013.	
20. Encourage users to engage with	McKinley, 2013.	

the institutions collection		
21. Acknowledge participation	Alam & Campbell, 2017; Cox et al. 2015; Holley, 2010; Liew, 2015; McKinley, 2013; Passau, O'Donovan, 2015; Causer & Terras, 2014.	
22. Show how project output is freely accessible to the public	Alam & Campbell, 2017; Gunther, Schall & Wang, 2016; Holley 2010; Liew 2015; McKinley, 2013.	
23. Convey the credibility of the project	Holley, 2010; McKinley, 2013.	
24. Publicly recognise contributions	Alam & Campbell, 2017; Holley, 2010; McKinley, 2013.	

Appendix 5: Partial extract from descriptive codebook.

		Manawatu Heritage	Online Cenotaph	Recollect: Upper Hutt City Libraries Heritage Collections	Discovery Wall	Digital NZ Stories
1. Provide clear, concise and sufficient task instruction						
Yes	Record any examples of ways that the website complies with this recommendation		Links to a "how to contribute" instruction page are placed in multiple prominent places on the home page. The "how to contribute" page includes a concise description of how to use the site, and an instructive video.	Task instruction is simple and is deliberately left open to interpretation. Text on the website advises users that their contributions "can be as short or long as you chose and you are welcome to add pictures or leave it as text.".	Helpful explanations are written below data entry fields.	The site homepage features a link to the "Learn how to create a story" page. This page features a step by step guide to contributing to the site, including annotated screenshots and an instructional video.
No	Record examples of non-compliance with this recommendation	Task instruction is incorporated into the task, however may not be sufficient for novice users.				
Notes	Examples of compliance may include: Instructive graphics, step by step instructions, and frequently asked questions.	A page of frequently asked questions or a step by step guide for contributions could be helpful.				
Clearly identify tasks						
Yes	Record any examples of ways that the website complies with this recommendation	Clear visual prompts identify tasks - visual graphics are used to represent tasks.	The option to contribute content is clearly visible on the right hand side of each record. There are multiple "contribute" buttons on each record.			Clear visual prompts identifying tasks. An invitation to contribute is prominently located on the front page of the website.

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No	Record examples of non-compliance with this recommendation			Tasks are not adequately identified. There is a menu running vertically along the left hand side of the home page with a "contribute" option. When the user clicks through to this they are given a selection of formats that can be contributed, however there is little contextual text on this page.	Tasks are not adequately identified. There is no 'call to action' on the front page of the site. The invitation to contribute is buried in a large chunk of text on the "About" page of the website.	
Notes	Examples of compliance may include: Clear navigation tools, clear visual prompts identifying tasks, Key tasks prominently located on the front page of the website.			Contextual information about the task would be useful for encouraging users to contribute.	I would recommend placing invitation to contribute in a more prominent position on the homepage.	
Simplify the task						
Yes	Record any examples of ways that the website complies with this recommendation	Tasks are divided into small easy to manage sections. ie. When contributing an article users are asked to enter title, main body, attributions and tags separately.	Tasks are divided into clear sections. ie: add contribution, add sources, preview, publish.	When users are in the "contribute" screen tasks are divided into sections. Basic data is required but additional data can be added in another window.	Tasks are split into distinct data input fields. Drop down options are available for some fields. Few steps are needed to upload content.	Adding records to a story is simple and intuitive. Users can stop at this point or add text to the content they have collected.
No	Record examples of non-compliance with this recommendation					
Notes	Examples of compliance may include: Tasks are divided into small, easy to manage sections, user interface is simple and easy to use, tasks are split into distinct data input fields.					
Minimise effort to contribute						

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Yes	Record any examples of ways that the website complies with this recommendation	The contribute button is placed prominently at the top right of the page. "Save draft" functionality means users can save and return to their work in a new session. A wide variety of file types are accepted. ie. jpg, jpeg, png, gif, bmp, tif, tiff, aac, tiff, flac, m4a, mp3, ogg, wav, mpg, avi, mov, wmv, mp4, m4v, ogv, webm, mkv, flv.	The option to bypass the site and email content in directly or print and post in a form is also available.	Auto save function means contributions are automatically saved as drafts and can be edited over multiple sessions. Copyright statements are simplified.	Users can contribute information in a few easy steps.	Records can be added to a users "story" directly from search results via the "Add to story" button.
No	Record examples of non-compliance with this recommendation	Registration required.	Registration is not required to add content, however a lot of personal details are required to add information. These details are not saved and need to be entered in to the system each time a user wants to contribute to a new profile. Registration required.	Registration required.	Registration required.	Registration required.
Notes	Examples of compliance may include: Optional registration requirement, auto-fill features.		Partially achieved.			
Mobile friendly / Responsive design						
Yes	Record any examples of ways that the website complies with this recommendation	Format of website changes when used on mobile devices.	Website is mobile optimised. Mobile format is clear and simple to use. The website is simplified and sections can be expanded for more details.		Format of website optimised for use on mobile device.	Website is usable on a mobile device.

No	Record examples of non-compliance with this recommendation	Entirety of website is not visible on certain devices. Difficulty in contributing from mobile device.		Entirety of website is not visible when accessed on a mobile device. Contributing from mobile device is difficult.	Website is less visually appealing on a mobile device.	Not all of the features of the site are available on mobile devices.
Notes	Examples of compliance may include: Format of website changes when used on different devices, website elements such as font size, images and layout are optimised for device type.	Partially achieved.			Partially achieved.	Partially achieved.