

**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

by
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Abstract

Research problem: The New Zealand Reading Experience Database (NZ-RED) is a crowdsourced history of reading project based on the UK-RED launched in 1996. The purpose of this study is to produce high-level functionality and usability requirements for a NZ-RED task interface that supports volunteer participation and rich data collection, and to determine the extent to which the UK-RED task interface meets these requirements.

Methodology: The case study takes a mixed-methods approach informed by grounded theory. Data was collected from RED project documentation and research, a usability inspection of the UK-RED task interface using evidence-based heuristics developed by Petrie & Power (2012), an online questionnaire of 112 current and potential RED contributors, an examination of recent crowdsourcing projects, and literature on crowdsourcing and human-computer interaction.

Results: This study established seven functionality and usability requirements for a NZ-RED task interface that supports volunteer participation and rich data collection: minimize user effort; support integration of the task with research processes; enable new visitors and contributors to understand what the task involves quickly and easily; support accurate and controlled data entry; be easy to use for people reasonably confident with the Web; support flexible, structured data entry; and support bilingual data entry. The UK-RED task interface partially meets four of the seven requirements.

Implications: Evidence-based requirements that inform project development and evaluation contribute to the social sustainability of crowdsourcing projects driven by academic and cultural heritage institutions. Future research could review the requirements produced by this study and consider their impact on the social sustainability of the NZ-RED and, potentially, World-RED partners. An increase in published requirements documentation could help to inform the requirements activity of other crowdsourcing projects, thereby reducing the time and expertise required. Future research could also investigate the value of studies like this one for other crowdsourcing projects.

Keywords: information systems, digital humanities, human-computer interaction, crowdsourcing, requirements, social sustainability

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1 Introduction

1.1 Background

Crowdsourcing is “an umbrella term for a highly varied group of approaches” to outsourcing tasks traditionally performed by specific individuals to a group of people or community through an open call (Howe, 2009, p. 280). It has also been described as “harnessing online activity to aid in large-scale projects that require human cognition” (Terras, 2012, p. 175). Increasingly, academic researchers and collecting institutions are crowdsourcing to create and enhance online collections and resources more cost-effectively, enable research, and engage the wider community. Projects that invite volunteers to participate in relatively complex tasks, such as manuscript transcription, text encoding, and data collection, rely heavily on task interfaces that capture sufficiently rich information for future research, and support ease of contribution and sustained participation. In this context, requirements are the needs that a task interface must satisfy to provide value to its stakeholders (Rogers, Sharp, & Preece, 2011, p. 349), who include the target research community, other resource users, and resource contributors. A requirement is “a statement about an intended product that specifies what it should do or how it should perform” (Preece, Rogers & Sharp, 2002, p. 204). The requirements activity aims to understand the users, their activities, and the context of that activity, so that the system under development can support them in achieving their goals; and produce a set of clear, specific, and stable requirements that form a sound basis to start designing and inviting user feedback (Rogers et al., 2011, pp. 352–353).

While it appears that the design of crowdsourcing task interfaces is influenced by projects that have preceded them, design guidelines should be “tailored for and validated against unique requirements” (Mayhew & Follansbee, 2012, p. 946). For this reason, this research takes a case study approach, focusing on one academic research project in development: the New Zealand Reading Experience Database (NZ-RED). Wai-te-ata Press at Victoria University of Wellington is one of four international partners collaborating on a World Reading Experience Database (World-RED) with the Open University, UK. Based on the UK project launched in 1996, the NZ-RED will collect reading experiences of New Zealanders from the nineteenth century to the present day. Volunteers will be invited to identify instances

of reading in diaries, letters, biographies and memoirs, from private collections, libraries and archives, and contribute their discoveries to the online database. For the UK-RED, “a ‘reading experience’ means a recorded engagement with a written or printed text - beyond the mere fact of possession” (“Contribute notes,” n.d.). Collecting data about what, where, when and how people read will enable patterns to emerge, and new research questions about the history of reading to be explored (Crone, Hammond, & Towheed, 2011; Crump, 1995; Eliot, 1996; Halsey, 2008; Liebich, 2012, p. 5; Towheed, Crone, & Halsey, 2011).

1.2 Purpose of the study

Like the REDs being developed in Australia, Canada, and the Netherlands, work on the NZ-RED to date has been based on the UK-RED template, but there is scope for customization.¹ The UK-RED task interface is a lengthy one-page online form with six compulsory and thirteen optional sub-sections (see Appendices A and B). No requirements documentation is available, and only previous versions of the form have been subjected to limited usability testing, which raises the question, “How effectively and efficiently does the task interface support rich data collection and volunteer participation?”. The purpose of this study is to produce high-level (conceptual) functionality and usability requirements for a NZ-RED task interface, and determine the extent to which the UK-RED task interface meets these requirements. These findings will inform the design of a working task interface prototype, to be developed in the next stage of the project. The findings of this study will also be relevant for the UK-RED project team, and World-RED project partners in the early stages of development.

¹ The UK-RED project team is keen “to ensure that there is at least a minimum level of commonality of search fields, and the possibility of a linked, umbrella search function which would allow cumulative searching across linked databases” (RED Technical Manual, 2008, p.18). In 2013 the UK-RED will be migrated to Drupal, which is a ‘back-end’ database solution. How RED is presented to users is independent of this, allowing for some degree of customization among partner REDs (King, 2012).

1.3 Research questions

To answer the main research question “What are the functionality and usability requirements for a NZ-RED task interface that supports rich data collection and volunteer participation?”, the requirements activity was driven by three key research questions:

1. What are the needs and objectives of RED contributors?
2. How efficiently and effectively does the UK-RED task interface support rich data collection and volunteer participation?
3. What are some alternative approaches to task interface design that might better support rich data collection and volunteer participation?

1.4 Significance of the study

For collecting institutions crowdsourcing “can continue a long standing tradition of volunteerism and involvement of citizens in the creation and continued development of public goods” (Owens, 2012). For academic researchers, this can extend to digital resources that support research and interpretation methods such as data visualisation, data mining and computational analysis. As Oomen and Aroyo (2011, p. 139) point out, not only can these new forms of collections usage lead to a deeper level of involvement with the collections, but these initiatives will also be of growing importance from a managerial and public relations perspective, as funding of many heritage organizations is based on their societal impact. For Humanities scholars in particular, “social research models offer one way to show relevance through involving a larger community”, at a time when Humanities’ “social contract with society is being challenged” (Rockwell, 2012, p. 151).

Accurate and verifiable requirements are important, as misconceptions about target users can result in an inappropriately designed user experience that could impact significantly on a project reliant on volunteer participation (IEEE, 1998; Mayhew & Follansbee, 2012, p. 952). Evidence-based requirements contribute to a project’s social sustainability, by looking to users to identify project priorities, and inform design and evaluation (Maron, Smith, & Loy, 2009, p. 11; Sommerville & Brar, 2009, p. 421). Academic and cultural heritage institutions that create digital collections and resources based on a ‘build it, they will come’ approach risk

misalignment with user needs and objectives, and undermining the resources invested. Marchionni (2009) emphasises the importance of “recognising that users are co-producers of a resource’s value” and observes that “the best projects have approached user engagement as a lifecycle process taking place before, during and after the creation of a digital resource and been informed by a strategic approach”. Nevertheless, research on crowdsourcing project requirements is extremely limited; this study begins to address the gap in the literature with a view to contributing to the strategic planning, development and evaluation of other crowdsourced projects.

2 Literature review

2.1 Overview

As Brabham (2012) observes, “crowdsourcing’s terrain is odd, its scholars far-flung, and its disciplinary location varied”. Consequently, this project draws on literature from a range of disciplines including human-computer interaction, information management, digital humanities, business, and design, as well as research specific to the RED and other crowdsourcing projects. The review presented below is guided by the main objectives of the requirements activity as outlined by Rogers et al. (2011, pp. 352–353): to understand the users, their activities, and the context of that activity, so that the system under development can support them in achieving their goals; and produce a set of stable requirements that form a sound basis to start designing and inviting user feedback.

2.2 Understanding the context

Digital technologies are contributing to the rise of an increasingly participatory culture; lowered barriers to collaboration, and evidence that personal contributions matter are encouraging people to take a more active role (Howe, 2009; Shirky, 2010; Simon, 2010). This shift has seen a blurring of boundaries between professionals and amateurs (Howe, 2009; Leadbeater, 2004; Shirky, 2010), and subsequent discourse on the value of social research models (Oomen & Aroyo, 2011; Ridge, 2012; Rockwell, 2012, p. 34). A product of this shift is the RED project, which invites anyone with an interest in the history of reading to contribute to the creation of

an open access online resource for research. Committed to the social construction of knowledge, the UK-RED team believes that “communities can collectively gather and assess more useful information than individual researchers working on their own” (“Contributing,” n.d.).

For academic and collecting institutions, most crowdsourcing projects do not involve anonymous masses of people (Owens, 2012), and the majority of contributions are made by a core group of dedicated participants (Causser & Wallace, 2011; Chrons & Sundell, 2011, p. 4; Taranto, 2011). Common motivations for participation include the size of the challenge, the necessity for volunteer contribution, collaboration with prestigious institutions, contribution to research, education, mental stimulation, being part of a community, personal research interests, and enhancing a resource from which they will benefit (Causser, Wallace, & Tonra, 2012, p. 127; Durbin, 2011; Holley, 2010; Smith, 2011). For the UK-RED project, the involvement of volunteers has built a community based on shared interest and fostered research skills. Volunteers have learned more about history and literature by focusing on an individual’s letters, diaries, or autobiography (Crone et al., 2011, p. 5). The UK-RED ‘crowd’ is made up of about 100 volunteers and several members of the project team, who have contributed over 30,000 reading experiences since it was launched online in 2007.

2.3 Understanding the users

Although intertwined with the Internet, crowdsourcing is not at its essence about technology (Howe, 2009, p. 11), and a task interface that effectively supports its users needs to reflect their needs and objectives (Denton, 2010, p. 20; Holley, 2010; Rogers et al., 2011, pp. 352–353). Inviting participants to register and provide personal information could enable the project team to learn about a potentially diverse crowd with varying levels of expertise, technical ability and available time (Greg, 2011, p. 50; Mayhew & Follansbee, 2012, p. 946). Requiring participants to log on or allow cookies² can enable the system to identify and acknowledge top contributors (Causser & Wallace, 2011; Holley, 2009). However, people may be hesitant to provide

² A cookie is a variable that is stored on the visitor's computer following a visit to a website. Each time the same computer visits the website it will send the cookie, which can include information about the visitor and their interaction. (“JavaScript Cookies,” n.d.)

personal information, some may want to try the system without going through the registration process, and others may find it a hassle to log on each time. To minimize the barriers to participation, volunteer registration is generally optional, and limited to username and password. Surveys are a more common method of learning about volunteer contributors, and requesting feedback about the system and processes (“AHRC Crowd Sourcing Study - Survey,” n.d.; Causer & Wallace, 2011; Durbin, 2011; Holley, 2009, 2010; Smith, 2011).

From the early stages of the project it was anticipated that the UK-RED would benefit greatly from enthusiasts and amateur scholars (Eliot, 1996, p. 86). However, prior to this study the information available about UK-RED contributor demographics, professional expertise, and technical ability was limited, and had not been collected in any systematic way. UK-RED contributors are required to enter their full name and email address in the online form, but no other information is requested. Questionnaires sent to contributors in 2006 and 2008 focused almost exclusively on the UK-RED website, and few responded. Any information known about contributors was based on personal interactions and email correspondence with the project team.

2.4 Understanding the users’ activities

Crowdsourcing projects in both the private and public sector have shown that participation is supported by breaking down tasks into manageable and meaningful components (Howe, 2009, pp. 285–287). The task interface needs to provide instruction in a way that makes participation accessible regardless of prior knowledge, and be sufficiently flexible to meet the needs of new and regular contributors, who may be using the system for several minutes or long periods of time (Cooper, Reimann, & Cronin, 2007, p. 47; Dunn & Hedges, 2012, p. 8; Rockwell, 2012, p. 147; Simon, 2010, p. 212). Decisions concerning the design of the task interface should be based in an understanding of interaction design, which concerns the options involved in performing and completing tasks, workflow patterns and conceptual frameworks (Garrett, 2003, p. 87; Mayhew & Follansbee, 2012, p. 946). Clarity and simplicity are important, and an effective and efficient interface minimizes the steps required to complete the desired action (Bacon, 2009, p. 124; Krug, 2006, p. 13). However, while a simple task interface may encourage new online visitors to participate, it may also

maximize the limited contributions of the many rather than the few. As the literature suggests most of the work is likely to be done by a small proportion of volunteers on a regular basis, enhanced functionality that enables them to contribute more data in less time might better serve NZ-RED project objectives in the long term.

2.5 Supporting the users' activities

Garrett (2003, p. 18) explains that any effort to enhance the user experience aims to improve efficiency, and “basically comes in two key forms: helping people work faster and helping them make fewer mistakes”. To determine how efficiently and effectively a crowdsourcing task interface supports volunteer participation and project objectives, a variety of evaluation methods should be employed to counter the limitations of any particular method and meet the needs of various phases of development (Cockton, Woolrych, Hornbaek, & Frokjaer, 2012, p. 1280; Folstad, Lai-Chong Law, & Hornbaek, 2012, p. 2133; Petrie & Power, 2012, p. 2115).

Usability inspection methods (UIMs) are discount methods of evaluation that aim to identify any potential difficulties that might impact on the user experience, and report how these can be remedied in redevelopment. They are analytical evaluation methods employed by usability experts, which do not involve end users and require minimal resources (Cockton et al., 2012, pp. 1279–1290). One of the most commonly used UIMs is Heuristic Evaluation (HE) developed by Molich and Nielsen in the 1990s, which aims to discover breaches of heuristics, or core principles (Cockton et al., 2012, p. 1280; Larusdottir, 2012, p. 28; Petrie & Power, 2012, p. 2107). Unlike more system-specific, task-based UIMs such as Cognitive Walkthrough (Wharton, Rieman, Lewis, & Polson, 1992), HE is a flexible resource that can be meaningfully applied across websites to enable comparisons. HE can also be used to inform complementary evaluation approaches such as user surveys (Folstad et al., 2012, p. 2133), which are an efficient way of collecting user evaluations in a relatively short time frame with minimal resources (Ant Ozok, 2012, p. 1259), and commonly used by crowdsourcing project teams (Holley, 2009; National Endowment for the Humanities, n.d.; Smith, 2011). Petrie and Power (2012) offer an updated and extended set of evidence-based heuristics to guide developers and expert evaluators of highly interactive websites, such as those requiring users to input information. Based on the application of several UIMs and user testing to a large corpus of problems,

these heuristics aim to redress the relatively low overlap between the problems found by users and experts in past studies.

Like other crowdsourcing projects that involve complex data entry, such as Transcribe Bentham (University College London) and What's the Score at the Bodleian? (University of Oxford), managing the tension between the research goal and the need to engage volunteer contributors beyond the target research community is a significant design challenge for the RED project (Causer et al., 2012, pp. 121–123; Eliot, 1996, p. 87). Although the UK-RED contribution form was designed with “clarity, flexibility, and ease of use in mind” (Crone et al., 2011, p. 5), prior to this study it had undergone no formal usability inspection and limited user evaluation. A total of 17 contributors responded to the questionnaire sent in 2007 and fewer to the questionnaire sent in 2008, both of which included only broad questions concerning usability. Furthermore, many volunteer crowdsourcing projects have been launched since the UK-RED task interface was last updated in 2009, and the user experience is becoming increasingly sophisticated (Dunn & Hedges, 2012; Oomen & Aroyo, 2011; Rockwell, 2012).

2.6 Producing a set of requirements

The main objectives of the requirements activity, as described by Rogers et al. (2011, pp. 352–353), reflect a user-centred approach to research and design that is suited to a platform for volunteer contribution such as the NZ-RED (Denton, 2010, p. 18). The requirements activity should help current and future users to accurately describe, and the designer and developer to understand, the needs and objectives that the system should be designed to support (IEEE, 1998, p. iii). This process is “an iterative activity in which the subactivities inform and refine one another” (Rogers et al., 2011, pp. 350–353), and benefits from the different perspectives provided by multiple data gathering techniques that may overlap. These might include examination of documentation, user surveys, user task analysis, comparisons with similar products, contextual enquiry, and exploratory prototypes (Rogers et al., 2011, p. 366). Analysis is “the process by which observations of users or inspections of interfaces are turned into prioritized, coherent descriptions of usability problems, including descriptions of causes, implications, and potential solutions” (Folstad et al., 2012, p. 2127). Analysed data is interpreted as a set of stable requirements, commonly

presented as textual descriptions supported by visual examples, and ranked for importance and stability (Folstad et al., 2012, pp. 2127–2133; IEEE, 1998, p. 4). Requirements should provide several benefits, including establishing a basis of agreement between stakeholders about what the task interface should do, reduce the development effort, provide a baseline for validation and verification, and serve as a basis for enhancement (IEEE, 1998, p. iii).

2.7 Summary

There is a growing body of research from which this study has drawn, to understand the context of crowdsourcing projects and volunteer participation. Less research has been conducted on the needs and objectives of the volunteers using particular task interfaces, which suggests this aspect of the relatively recent phenomenon of crowdsourcing is still little understood. While the literature and theory on requirements activity and representation provides a solid foundation for this research project, case studies on this particular topic are few; Denton (2010) is the only study on establishing requirements for a volunteer task interface that could be located. This suggests that either few crowdsourcing projects have committed to the requirements process, or internal requirements documentation has been overlooked or considered of insufficient value for publication.

3 Methodology

3.1 Research strategy

The main objectives of the requirements activity outlined above were the drivers for data collection, analysis, and interpretation; to meet the objectives of the requirements activity, and fully address the research question, the study took a mixed-methods approach, with an emphasis on qualitative data. The limited literature on the research topic, the inductive nature of the requirements activity, and the study's emphasis on stakeholder perspectives are suited to a grounded theory approach, a research method that derives evidence-based theory from data systematically gathered and analysed through the research process (Glaser & Strauss, 1967, 1999; Strauss & Corbin, 1998; Urquhart, 2000, 2001). Providing “relevant predictions, explanations, interpretations and applications” (Glaser & Strauss, 1999, p.1), grounded theory methods have been used increasingly over the last decade for human-computer interaction and information systems research (Muller & Kogan, 2012; Urquhart, Lehmann & Myers, 2010). In this study grounded theory methods informed the iterative process of establishing conceptual requirements; an open-minded approach was taken to research in lieu of hypothesis; early data analysis and categorisation guided further data collection until theory in the form of conceptual requirements and rationale emerged; the continuous interplay of data collection and analysis helped to refine requirements; and constant comparison of theory with the data served to strengthen those requirements.

3.2 Scope

Development of the NZ-RED task interface will be based on different types of requirements, which relate to functionality, the data it is designed to capture, its context of use, and usability (Rogers et al., 2011, pp. 357–362). This study focuses on functionality and usability requirements, and does not extend to the reading experience data it is designed to capture, or the role of the NZ-RED in the context of history of reading research. Functional requirements capture what the task interface should do; usability requirements have been interpreted broadly, to include the effectiveness and efficiency of the task interface, and the characteristics and

satisfaction of its intended users (International Organization for Standardization as cited in Marcus & Gould, 2012, p.343; Preece, Rogers & Sharp, 2002, pp.204-208). These delimitations reflect the researcher's expertise and the time constraints under which the research was conducted. The study assumes the NZ-RED task interface aims to collect most, if not all, of the types of data collected by the UK-RED.

3.3 Data collection

To address the key research questions the following data gathering techniques were employed:

- Examination of RED project documentation and research
- Heuristic evaluation of the UK-RED task interface
- An online survey of current and potential RED contributors
- Examination of other crowdsourcing task interfaces
- Examination of the literature on human-computer interaction

The researcher is a member of the NZ-RED project team, responsible for developing and implementing components related to crowdsourcing. As such, the researcher had the support of the NZ-RED team and World-RED partners, and access to project documentation, UK-RED contributor contact details, and history of reading research communication channels. Details of individual data collection techniques are provided below.

RED project documentation and research

The researcher examined all published RED research, and RED project documentation including reports, results of past questionnaires, UK-RED newsletters, NZ-RED project meeting minutes, and email communications. The examination also included the UK-RED website and wiki, and the UK-RED and NZ-RED project blogs.

Heuristic evaluation of the RED task interface

The researcher conducted a usability inspection of the UK-RED task interface using the set of twenty-one evidence-based heuristics developed by Petrie and Power (2012) to assist with the design and evaluation of highly interactive websites (see Appendix E). It appears that this study is among the first to test the new set of heuristics. HE was selected from several usability inspection methods for flexibility and consistency; the same set of heuristics were used to code responses to the survey's evaluative and workflow-related questions (Folstad et al., 2012, p. 2133).

Only one pass of the UK-RED task interface was taken, as the researcher was familiar with the scope of the interface and flow of interaction (Cockton et al., 2012, p. 1281).³ Any breach of heuristics was recorded and rated using the four-level severity scale developed by Molich and Nielsen and commonly employed by usability experts (Petrie & Power, 2012, p. 2107), whereby:

- 1 = Cosmetic problem only
- 2 = Minor usability problem: low priority
- 3 = Major usability problem: high priority
- 4 = Usability catastrophe: imperative to fix (Nielsen, n.d.)

Nielsen (n.d.) explains that the severity of a usability problem is a combination of three factors: the frequency with which the problem occurs, the impact of the problem if it occurs (how easy or difficult is it for users to overcome), and the persistence of the problem. Nielsen goes on to point out that even if the usability problem is “objectively” quite easy to overcome, it could impact significantly on the overall popularity of the product or system. Potential usability problems specific to UK-RED contribution form sections and sub-sections were labelled using abbreviations, for example, “S1/6” represents Section 1, sub-section 6. During the course of the inspection the researcher also noted particular strengths of the interface in relation to the heuristics, in order to fully address the research question.

³ The inspection was conducted using a 20-inch iMac running on OS X Lion version 10.7.5 / Safari 6.0.2. Some usability issues were also checked in Firefox, and on a PC running Windows 7, and a sample record was created using an iPad 1. No browser-specific or device-specific issues were identified.

Nielsen (n.d.) has observed that, “severity ratings from a single evaluator are too unreliable to be trusted”. Generally, heuristic evaluations are conducted by two or more experts, who work together to consolidate and rate their findings (Petrie & Power, 2012, p. 2107). This improves the thoroughness and reliability of problem identification, and consistency of analysis (Folstad et al., 2012, p. 2128). Due to limited resources and available expertise, only one evaluator conducted this inspection. However, the evaluation benefitted from the researcher’s domain expertise and demographic alignment to target users, and is supported by multiple data-gathering techniques.

A total of 32 potential usability problems were identified in the course of the inspection (see Appendix F). Of these, 6 were rated major (high priority), 23 minor (low priority), and 3 cosmetic only. Major problems were identified in three categories: Physical Presentation, Content and Interactivity. Problems were distributed across all four categories and predominantly related to interactivity (see Figure 1).

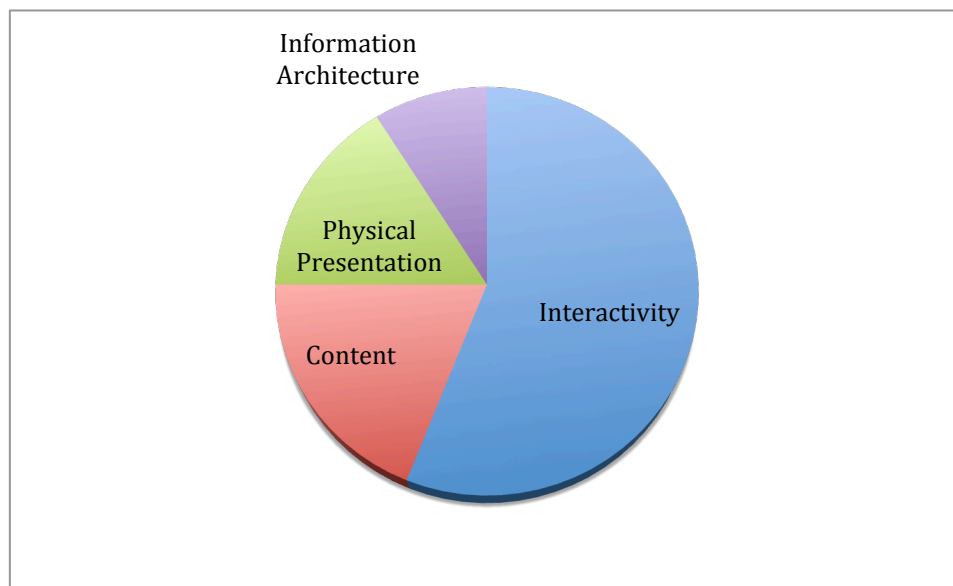


Figure 1 Potential usability problems identified in the inspection of the UK-RED task interface

Online survey

In December 2012 a survey was conducted via an online questionnaire, to understand the needs and objectives of current and potential RED contributors, discover how effectively the UK-RED interface supports rich data collection and volunteer participation, and identify some alternative approaches to interface design that might better support rich data collection and volunteer participation. The survey was anonymous, and completed submissions implied that the participant had given consent for their responses to be used in the research project.⁴ The survey was sent to as large a potential participant pool as possible, to help ensure heterogeneity and results that were representative of current and potential RED contributors in general (Ant Ozok, 2012, pp. 1274–1275). The stakeholders targeted included the RED project teams, history of reading researchers, and reading enthusiasts. The invitation to participate was sent via email to 115 people who have contributed to the UK-RED,⁵ and posted for 275 UK-RED followers on Twitter, with a link to more information on the NZ-RED blog. The invitation was also sent to potential RED contributors in Australia, Canada, Netherlands, New Zealand, and elsewhere via the Society for the History of Authorship, Reading and Publishing (SHARP) list-serv, which has more than 2700 subscribers, as well as New Zealand Libraries (NZ-Libs) list-serv subscribers, and Faculty of Humanities and Social Sciences staff at Victoria University of Wellington. For the information sheet that accompanied the invitation see Appendix C.

Survey responses were gathered, reported and cross-tabulated using Qualtrics survey software. During the 3-week period 125 respondents started the survey, and 112 submitted completed surveys (a 90% completion rate). Only the responses from the 112 completed surveys were included in the analysis. The majority of respondents (78%) currently reside in the UK, New Zealand or the USA, with others residing in Europe, Canada, and Australia (see Figure 2). The age of respondents ranged from 15-25 years to 75+ years, with the largest group (30%) aged 56-65 years (see Figure 3). The majority of respondents (69%) were female. Of the 33% of respondents who had used the UK-RED contribution form, the majority currently reside in the UK or Europe.

⁴ Approved by the Victoria University Human Ethics Committee on 9 December, 2012.

⁵ Twenty-two email addresses were returned as no longer current.

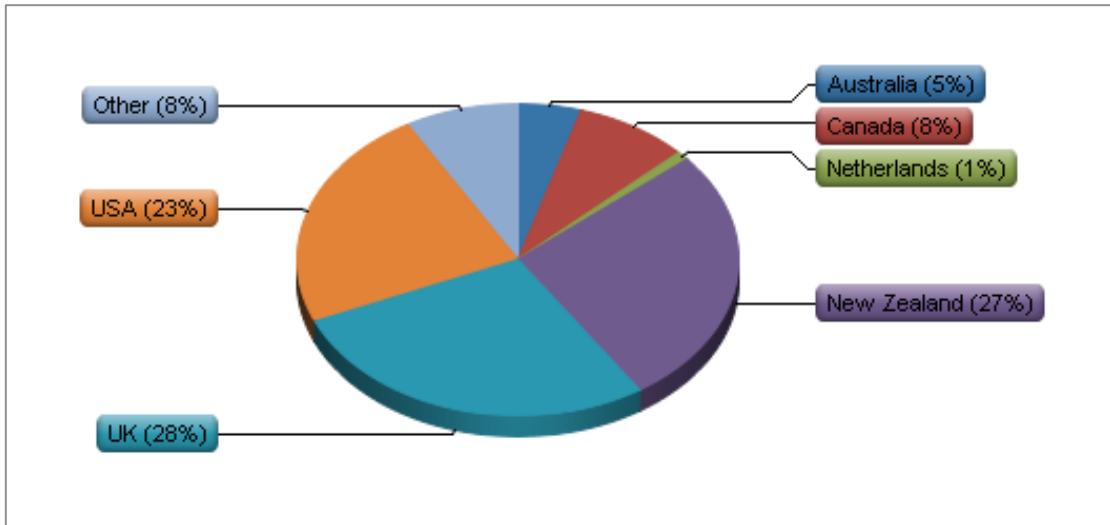


Figure 2 Survey respondents by country of residence

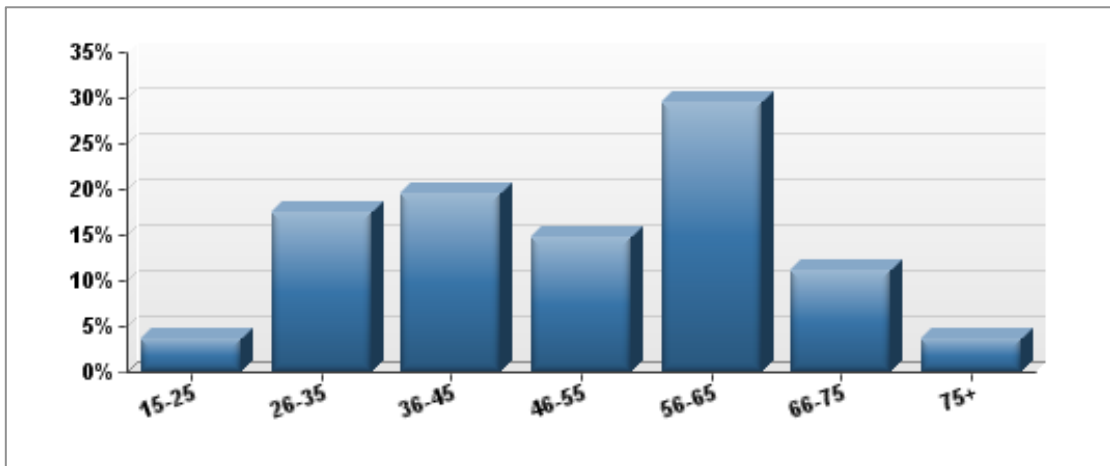


Figure 3 Survey respondents by age range

The survey included nineteen questions (see Appendix D) and took less than five minutes for most respondents to complete. The first section was relevant to all participants, and the second section was designed for those who have used the UK-RED interface. The questions pertained to interface evaluation, contributor workflow, and demographic information relevant to the user experience (Ant Ozok, 2012, pp. 1266–1275; Marcus & Gould, 2012, p. 343). For consistency, all responses relating to the usability and functionality of the UK-RED contribution form were coded using the set of heuristics employed in the usability inspection and rated for severity by the researcher (see Appendix G). Survey respondents identified a total of 23 problems. Of these, 13 were rated by the researcher as major (high priority), 9 minor (low priority), and 1 cosmetic only. Consistent with the usability inspection, major problems were identified in three categories: Physical Presentation, Content and Interactivity. Likewise, problems were identified in all four categories and predominantly related to interactivity (see Figure 4).

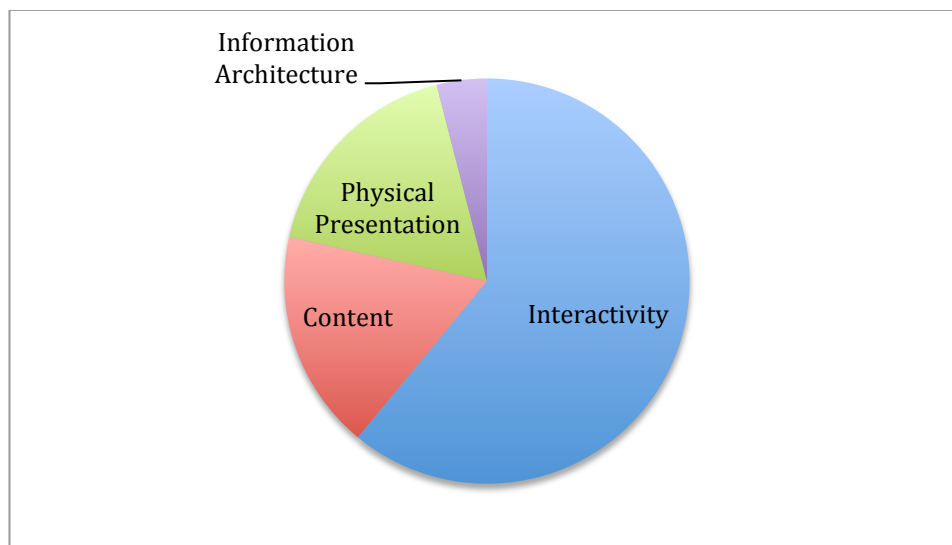


Figure 4 UK-RED task interface problems identified by survey respondents

Examination of other crowdsourcing task interfaces

An examination of other crowdsourcing task interfaces was conducted to identify some alternative approaches to task interface design that might better support rich data collection and volunteer participation. Examinations focused on identifying approaches that could be adapted to address real and potential usability problems and opportunities for enhancements, which were identified by the other methods of data collection. Nine projects were selected from a list previously compiled and regularly updated by the researcher (see Table 1).⁶

Project	Institution	Launched
Citizen Archivist	National Archives, USA	2011
The Indexer (in development)	Archives New Zealand	2013
Old Weather	Collaborative Zooniverse project	2010
Seafloor Explorer	Collaborative Zooniverse project	2012
Snapshot Serengeti	University of Minnesota	2012
Trove (Historical newspaper project)	National Library of Australia	2008
What's on the Menu?	New York Public Library	2011
What's the Score at the Bodleian?	University of Oxford	2012
Your Paintings Tagger	UK Public Catalogue Foundation & the BBC	2011

Table 1 Crowdsourcing projects examined

⁶ For the list of crowdsourcing projects see digitalGLAM. (2012). *Crowdsourcing projects*. Retrieved February 12, 2013 from <http://www.digitalglam.org/crowdsourcing/crowdsourcing-projects/>

3.4 Data analysis and interpretation

Adapting the grounded theory approach proposed by Corbin and Strauss (2008; Strauss & Corbin as cited in Leedy & Ormrod, 2013, 147), categories in the form of requirements were developed, based on themes that emerged from the data sourced from the examination of RED project documentation and research, the usability inspection, and the survey. This process was conducted alongside axial coding, which identified relationships between requirements; the motivation, rationale, and implications behind them; and the actions that could be taken to meet them. Subsequent data collected from the examination of other crowdsourcing task interfaces and literature on human-computer interaction aimed to saturate these categories, and find any evidence that challenged them.

Over the course of the project the eighteen requirements that emerged were combined and refined until seven high-level requirements were established. Requirements are presented as textual descriptions using a custom template adapted from the widely used Volere requirements shell developed by Robertson & Robertson (2012, p.5, “Requirements Specification Template”, 2013) (see Appendix G). The custom template helped to guide the approach to data analysis and interpretation outlined above, and was designed to support implementation (see Table 2). Due to the conceptual density of requirements they were not ranked for importance.

Requirements template field	Description
Description	A one sentence statement of the intention of the requirement
Type	Functionality/Usability
Motivation	Supports volunteer participation and/or supports rich data collection
Rationale	A justification of the requirement
Basis for rationale	Evidence that forms the basis for the justification
Extent to which UK-RED meets requirement	The UK-RED either fully, partially, or does not meet the requirement based on supporting evidence
Suggested actions	Suggested actions to address the issues identified, based on data collected or ideas that emerged in the course of research. Some will form the basis of low-level (executable) requirements.
Evaluation criteria	Evaluative measures to determine the extent to which the NZ-RED meets the requirement
Assumptions	Requirement-specific assumptions not already outlined in the report
Dependencies	Requirements that are dependent on or related to the one being described
Conflicts	Requirements that could potentially conflict with the one being described
Implication	The potential consequences of not meeting the requirement

Table 2 Customised requirements template

4 Results and Discussion

Seven high-level functionality and usability requirements for a NZ-RED task interface that supports rich data collection and volunteer participation were established as a result of this research:

1. The task interface shall minimize user effort
2. The task interface shall support integration of the task with research processes
3. The task interface shall enable new visitors and contributors to understand what the task involves quickly and easily
4. The task interface shall support accurate and controlled data entry
5. The task interface shall be easy to use for people reasonably confident with the Web
6. The task interface shall support flexible, structured data entry
7. The task interface shall support bilingual data entry

4.1 Requirement #1

Description: The task interface shall minimize user effort

Type: Usability

Motivation: Support volunteer participation

Rationale: The majority of NZ-RED contributors will have limited time to participate

Basis for rationale: The majority of survey respondents (85%) discover reading experiences in the course of their reading/research, which is promising for the NZ-RED project, however some may be deterred from contributing if too much effort is required.⁷ Most respondents (85%) were under the approximate retirement age of 65. Academics made up 44% of respondents, with the library/archives/museum professions (26%) and postgraduate students (15%) making up the next largest groups (see Figure 5). Of the survey respondents who no longer contribute to the UK-RED, 54% indicated this was due to lack of time. As one respondent explained, “I found it too time consuming to enter items into the online form, so I stopped doing so, and instead concentrated on making sense of the references I was finding for my PhD. I had intended to enter them into RED as I went along, but it was taking too much

⁷ Unless otherwise stated, survey results refer to the 2012 survey conducted for this project.

time.” Minimal effort could serve as an incentive to participate on a casual and regular basis for both the target research groups and the wider community.

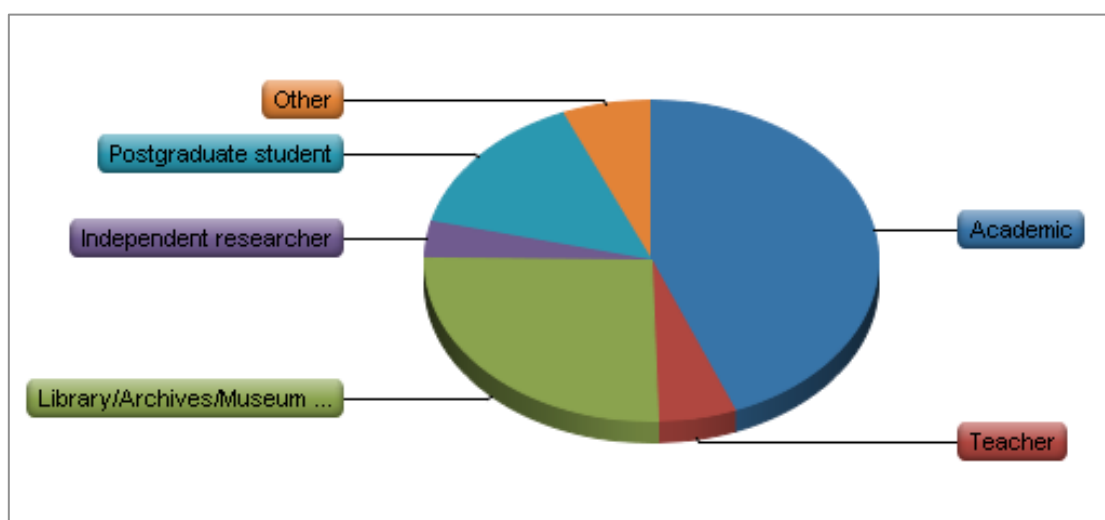


Figure 5 Survey respondents by profession (former profession if retired)

Extent to which UK-RED meets requirement: Partially

Prioritization: The UK-RED task interface is divided into three sections arranged in a hierarchical order, which prioritizes the key information required for a RED record and the data contributors are most likely to have (Crone et al., 2011, p. 431), and enables contributors under time pressure to create a record without having to provide full details (Crump, 1995, p. 1).

Duplication of effort: Users with several reading experiences from the same source or reader/listener can duplicate the record created directly after submission, to act as a template for the next record and reduce duplication of effort. However, as the heuristic evaluation identified, records created during a prior session cannot be accessed for this purpose. This could make for considerable duplication of effort if users are contributing reading experiences from the same source or about the same reader/listener over time, and was rated a high-priority issue. Another high-priority issue was identified by a survey respondent, who noted that the task interface should highlight the importance of searching for an existing record in the database before creating a new one, and include a link to the search screen in the explanation. Several

minor issues were also identified; one survey respondent noted that users are asked to enter the date/date range as well as the century of the reading experience, which could be automatically populated based on the date/date range. The heuristics evaluation noted that users are required to enter their name and email address for every new record (unless immediately duplicated). Users are also instructed to go through the review process a second time before submitting the record if any changes have been made in review mode, which was considered an unnecessary extra step.

Workflow: The limitations of template creation may explain why some contributors collect several reading experience before adding them to the database. Asked how they typically add new records, 61% of UK-RED contributors who participated in the survey collect several reading experience before adding them to the database, and 39% add new reading experiences to the database as they find them. Cross tabulated survey results indicates that it takes less time for contributors to create records when they collect several reading experiences before adding them to the database. One respondent commented that it is particularly difficult to do a ‘one-off’, and it is easier to create records in batches after collecting several references using Word. This ‘work-around’ solution, which involves double keying and copying and pasting of data, requires additional effort on the users’ part. Almost all UK-RED contributors who responded (90%) generally complete as many sections of the contribution form as possible, and 10% the first section only. It generally takes less than 10 minutes for 24% of respondents to complete the task. The majority (55%) generally take 10-20 minutes, and 21% take 20-30 minutes.

Suggested actions:

Prioritization: There is no evidence to suggest the UK-RED hierarchy for data collection should not be used for the NZ-RED.

Duplication of effort: NZ-RED project documentation contained several suggestions for reducing duplication of effort. Users could access previously created records by logging in to a personal user account, and duplicate them to create new templates (McKinley, 2012d, p.2). As a survey respondent suggested, this could potentially be extended to any published record in the database. Initial task interface instructions could promote a 3-step process, whereby users 1) sign up, 2) search for existing

record, and 3) contribute (McKinley, 2012a, p.5). The interface could alert the user to potential duplication if the title of the text being read, the source title, and the name of the reader/listener match an existing record in the database (McKinley, 2012d, p.2). Contributors could be required to register and login each session, enabling the system to link all created records with their username, and removing the necessity for name and email fields in the task interface. Alternatively, contributors could be required to register initially but not login if all records were linked to a username via cookies, which is the intended approach for The Indexer project being developed by Archives New Zealand (T. Almond, personal communication, August 17, 2012). As suggested by the heuristic evaluation, the steps required in review mode could also be reduced.

Evaluation criteria: A heuristic evaluation conducted during beta testing shall find that the NZ-RED task interface avoids duplication and excessive effort by users.⁸ This shall be supported by a survey of beta version users, which does not identify any major issues relating to duplication or excessive user effort. The time required to complete the task shall be evaluated separately; during the alpha-testing phase the majority of a representative sample of test users under observation are able to create a range of records in less than ten minutes each.⁹ During the beta-testing phase a survey of users shall show that the majority of users can create new records in less than ten minutes (website statistics that measure time on site could supplement this information).

Assumptions: The time frame for creating a new record is based on information on the UK-RED website; new contributors are informed that while the form is long in order to capture as much contextual information about reading experiences as possible, it should take no longer than ten minutes to complete (“How to contribute,” n.d.). It is presumed this is based on the assumption that users have all the relevant reading experience data at hand, which as one survey respondent commented, is an aspect of the task that can be time-consuming. Asking potential NZ-RED contributors what they consider an acceptable length of time during user-testing would serve to support or challenge this time frame. It is also possible that a greater proportion of

⁸ Beta testing is a form of user testing, whereby the software is released to a limited group outside the project team

⁹ Alpha testing is simulated or operational testing by potential users at the project development site

retired people could make up NZ-RED contributors than the survey results suggest, due to the online communication channels used to disseminate the survey. It is possible that retired people may be less concerned about the time required to complete the task.

Dependencies:

Requirement #2. The task interface shall support integration with research

Requirement #3. The task interface shall enable new visitors and contributors to understand what the task involves quickly and easily

Requirement #5. The task interface shall be easy to use for people reasonably confident with the Web

Implication: Requiring excessive effort of users may impact negatively on user retention, frequency of participation, and rate of contribution.

4.2 Requirement #2

Description: The task interface shall support integration of the task with research processes

Type: Functionality

Motivation: Support volunteer participation and rich data collection

Rationale: The majority of contributors are likely to use the NZ-RED for their own research

Basis for rationale: The main focus of reading/research for the majority of respondents is literature (45%), followed by history of the book (30%), history of reading (26%) and other fields of history (12%). Other fields listed include publishing, translation, family history, and the arts. In response to the question “Do you (or might you in the future) use a RED for your own research purposes?” 47% of all survey respondents said yes, and 39% said maybe.

Extent to which UK-RED meets requirement: Does not meet requirement.

Suggested actions:

Save partially completed records: A contributor may be interrupted, run out of time, or have more data to add that needs to be accessed from elsewhere, but the UK-RED task interface does not allow for such workflow interruptions (McKinley, 2012g). The potential for users to save partially completed records and return to them later was raised in survey comments, NZ-RED project documentation, and the examination of other crowdsourcing interfaces. Trove and What’s the Score at the Bodleian? Are two examples of projects that include this functionality (see Figure 6).



Figure 6 What's the Score at the Bodleian? – records can be saved and completed or edited later

Delayed publication: Some researchers may wish to use the NZ-RED task interface to create records for their own research projects, but delay record publication until after their work is completed/published. NZ-RED project documentation suggested enabling users to create, save, and access records while they are conducting research, and make them publicly available once the research has been published (McKinley, 2012g).

Record correction and enhancement: NZ-RED project documentation suggests enabling contributors to correct or add to their own published records as they encounter new information in the course of reading/research, which could be extended to published records created by others (McKinley, 2012g). This collaborative approach to accuracy and enhancement is employed by other crowdsourcing projects, using various strategies: What's on the Menu? records include a link to email the project team with information, Citizen Archivist allows users to edit completed transcriptions directly, and Your Paintings records invite users to share their knowledge via an online form, email or post.

Bulk upload: One survey respondent commented that it is easier to create records in batches after collecting several references. The respondent uses Microsoft Word to collect references, but using a spreadsheet that enabled bulk uploading of records

would be a more efficient alternative, and would also support users researching offline. Spreadsheet columns could be labelled with task interface fields, which is a common method of bulk importing data into collection management systems (“Importing Data”, 2013).

Customization: The standardised UK-RED form includes fields/options that will not be relevant for every user, and presents them in a fixed format. Enabling users to customize the task interface with the optional fields most relevant to their reading/research sources has the potential to optimize workflow and reduce the time required to create a record. Users could ‘drag and drop’ fields into their custom template in their preferred order. Alternatively, users could choose from a selection of pre-formatted templates, which only include fields relevant to a particular period or source type (McKinley, 2012f). Customizing the task interface to reflect the nature of the data being collected is an approach being developed for project administrators of The Indexer, which could potentially be adapted for the NZ-RED (see Figure 7 and Figure 8).

Evaluation criteria: NZ-RED project administration records will show that functionality supporting the integration of the task with research processes is being used. A survey of beta version users will identify the functions most useful to researchers, and discover how these functions are contributing to rich data collection and volunteer recruitment, participation and retention.

Implication: Not providing functionality that enables users to integrate the task with research processes may impact negatively on user recruitment and retention, frequency of participation, overall contribution, and rich data collection.

The Indexer ARCHIVES NEW ZEALAND

Home Instructions Hall of Fame FAQs About The Indexer Admin

Dashboard > Create a Job Group

Create a Job Group: Define Layout

1. Details 2. Fields 3. Field Help 4. Layout 5. Create

1 Choose a template to suit the image proportions - view image from group.

Portrait
 Landscape
 No image

2 Set the field layout (drag & drop fields to desired layout)

Surname
 First Names
 Location
 Charge
 Page Numbers

3 Quick Preview - go to full preview.

APPLICATION FOR RELIEF.		Date
NAME	Age	Wife's M.
Bastey Annie	16	
Annie	17	
Birdha	15	
Annelia	14	
Emily	13	
Lily	11	
Anny	21	

Surname	First Names	Location
<input type="text"/>	<input type="text"/>	<input type="text"/>
Charge	Page Numbers	
<input type="text"/>	<input type="text"/>	
Surname	First Names	Location
<input type="text"/>	<input type="text"/>	<input type="text"/>
Charge	Page Numbers	
<input type="text"/>	<input type="text"/>	

Field Help

Click on the field you need to help with to see it in this panel.

Field Layout

The number of columns you specify will have a lorem ipsum dolor consectetur adip scing elit, sed diam nonummy eius mod tempor incididunt ut labore et dolore magna aliquam erat volupat.

Figure 7 The Indexer – customization of task interface layout

The Indexer *Tatiana Ugo Karana* *62* **ARCHIVES NEW ZEALAND**

Home Instructions Hall of Fame FAQs About The Indexer Admin

Dashboard > Create a Job Group

Create a Job Group: Customise Fields

1. Details 2. Fields 3. Field Help 4. Layout 5. Create

1 Specify the type of entries

Single
 A single set of fields that only need to be entered once.

Single + Multiple
 A single set of fields, plus an unspecified no. of repeating field sets.

Multiple
 An unspecified no. of repeating field sets only.

2 Specify single entry fields

Archival References	Field Label	Public	Match
Unique Archway Item ID	Archway Item ID	<input type="checkbox"/>	<input type="checkbox"/> ✕
Generic Reference Number	Ref. No.	<input type="checkbox"/>	<input type="checkbox"/> ✕
Agency Code	Agency Code	<input type="checkbox"/>	<input type="checkbox"/> ✕
Series Code	Series Code	<input type="checkbox"/>	<input type="checkbox"/> ✕

[Add Another](#)

People & Organisations	Field Label	Public	Match
		<input type="checkbox"/>	<input type="checkbox"/> ✕

[Add Another](#)

Additional Data	Field Label	Public	Match
		<input type="checkbox"/>	<input type="checkbox"/> ✕

[Add Another](#)

3 Specify multiple entry fields

People & Organisations	Field Label	Public	Match
Family Name	Surname	<input type="checkbox"/>	<input type="checkbox"/> ✕
Given Names	First Names	<input type="checkbox"/>	<input type="checkbox"/> ✕
Age	Age	<input type="checkbox"/>	<input type="checkbox"/> ✕

[Add Another](#)

Additional Data	Field Label	Public	Match
Custom	Something here	<input type="checkbox"/>	<input type="checkbox"/> ✕

[Add Another](#)

Field Help

Click on the field you need to help with to see it in this panel.

Something Here

The number of columns you specify will have a lorem ipsum dolor consectetur adipiscing elit, sed diam nonummy eius mod tempor incididunt ut labore et dolore magna aliquam erat volutpat.

Figure 8 The Indexer – customization of task interface fields

4.3 Requirement #3

Description: The task interface shall enable new visitors and contributors to understand what the task involves quickly and easily

Type: Usability

Motivation: Support volunteer participation

Rationale: The NZ-RED is reliant on participation from diverse groups on an ongoing basis.

Basis for rationale: The NZ-RED is reliant on participation from diverse groups on an ongoing basis, in order to reach a critical mass of representative data that will enable the testing of research questions and reliable identification of patterns. Relying too heavily on a small number of contributors could result in a concentration of data that reflects their particular reading/research areas (Crone et al., 2011, pp. 432-435). Potential NZ-RED contributors could include academics and students; members of research networks; historians; writers; genealogists; librarians, archivists and museum professionals; library, archives and museum patrons and supporters; members of relevant associations and societies, book clubs, booksellers, and the general public (McKinley, 2012a, pp.3-4). Minimizing the period of familiarisation with the task will encourage the participation of people with varying levels of expertise, motivation and commitment. It will also support the preparation of new contributors who need to familiarize themselves with the questions asked so they “have the information handy”, as one survey respondent explained. Watzmann and Re (2012, pp. 327-328) emphasize the important role that design plays in engaging visitors; a well-designed interface draws in the visitor, enables them to quickly understand the information hierarchy, and motivates them to accept the invitation [to participate].

Extent to which UK-RED meets requirement: Partially

Information organisation: Several strengths of the UK-RED task interface were noted during the course of the heuristic evaluation; it uses ‘chunking’ to break information into manageable sections and sub-sections according to subject matter (Watzmann and Re, 2012, p.328), and headings, subheadings, bolding, and horizontal lines to clearly distinguish sections and sub-sections. Information is organized hierarchically

(or ‘queued’) according to logical order and importance, and field labels are concise. The majority of survey respondents (59%) indicated that the UK-RED form is logically organized. However, 18% indicated it could be better organized, and one respondent commented that the layout is difficult to follow.

Length of the form: The heuristic evaluation identified several potential usability issues related to the length of the form. As aforementioned, the standardised form includes fields/options that will not be relevant for every user. Presenting text instructions alongside fields adds to the length and complexity of the page, which was rated high-priority. A minor issue is the duplication of text in subheadings and field headings (provenance, occupation, religion, country of origin, and country of experience), which further adds to the length of the page. Users are required to scroll down the full length of the page in order to understand what the task involves. A significant proportion of survey respondents (28%) indicated that the form appears too long. It has also been observed that because the length of the form makes it difficult to see all the sections and fields that follow, it is possible to enter data too soon in incorrect fields (McKinley, 2012g).

Presentation: With regard to the logical and clear presentation of options, the heuristic evaluation identified several minor issues: a wide range of genre/subject matter options are presented in apparently random order, which does not aid selection; century of reading experience date ranges are inconsistent; and the layout of “Type of experience” options makes it unclear how many can be selected.

Legibility & Readability: As Watzmann and Re (2012, pp. 322-325) explain, typographic choice affects the ability to easily see and understand what is on the page. In the case of the UK-RED, the main body text uses type suited to online reading (font-family: Verdana, Arial, Helvetica, sans-serif, size: small), appropriate bolding, and large, clear headings for section and sub-sections. However, the heuristic evaluation identified several potential issues. The use of red text for section headings and subheadings, as well as instructions and body text could negatively affect the ability of new visitors and contributors to quickly understand the information hierarchy, which was considered high-priority (Watzmann & Re, 2012, p. 334). Minor issues include the x-small/10pt font size of text used for “view notes” and

alongside radio buttons and check-boxes, and the small size of day/month menu boxes, which may cause readability problems for some users or cause these elements to be overlooked. It should also be noted that coloured type appears smaller than the same type in black (Watzmann & Re, 2012, p. 334). Some users may find the red headings difficult to read online, and consider the use of red h2 text for two sentences of instruction at the end of Section 1 and 3 to be aggressive communication. Two survey respondents mentioned the heavy use of red text, commenting that it is not appealing on the chosen background and demands a lot of attention. These observations are reflected in the literature, which explains that saturated colours such as red can be distracting and irritating online (Watzmann & Re, 2012, p. 338). Only 28% of survey respondents found the form easy to read, and 10% of respondents found it somewhat difficult to read, which is a major issue.

Language: Only 28% of survey respondents indicated the form was easy to understand, and 22% indicated that some parts were difficult to understand, which is a major issue. One respondent commented that the “Type of experience” section was particularly taxing because it uses unfamiliar concepts. The heuristics evaluation identified several potentially minor issues related to language: provenance may be an unknown term for some contributors (although the options suggest the meaning); the term “radio button” will not be familiar to some users, and is unnecessary; “Contribute Review” is an ambiguous title for the page where users review their completed form; and the instruction to “save” the reviewed record rather than “submit” suggests users may be able to access the saved form.

Suggested actions:

Information organisation: There is no evidence to suggest that the NZ-RED should not clearly distinguish sections and sub-sections with the headings, subheadings and field labels used for the UK-RED.

Length of the form: The issue of content relevance is addressed in the suggested actions for Requirement #2. Presenting task instructions as help icons throughout, which users click to show (without navigating from the task interface) would reduce the text on the page (see Figure 9). Addressing the duplication of text in subheadings and field headings (provenance, occupation, religion, country of origin, and country

of experience) would further reduce the length of the page. The examination of Your Paintings Tagger suggested an alternative approach to a one-page form, which could be adapted for the NZ-RED. Each stage of the task, together with accompanying instructions and examples, is presented on a separate page above the fold, and headings along the top of the task interface represent each stage of the task (see Figure 10).¹⁰ The interface makes use of the grid approach, whereby consistent placement of all visual elements enables the user to anticipate what each stage of the task will involve (Watzmann & Re, 2012, p.330).

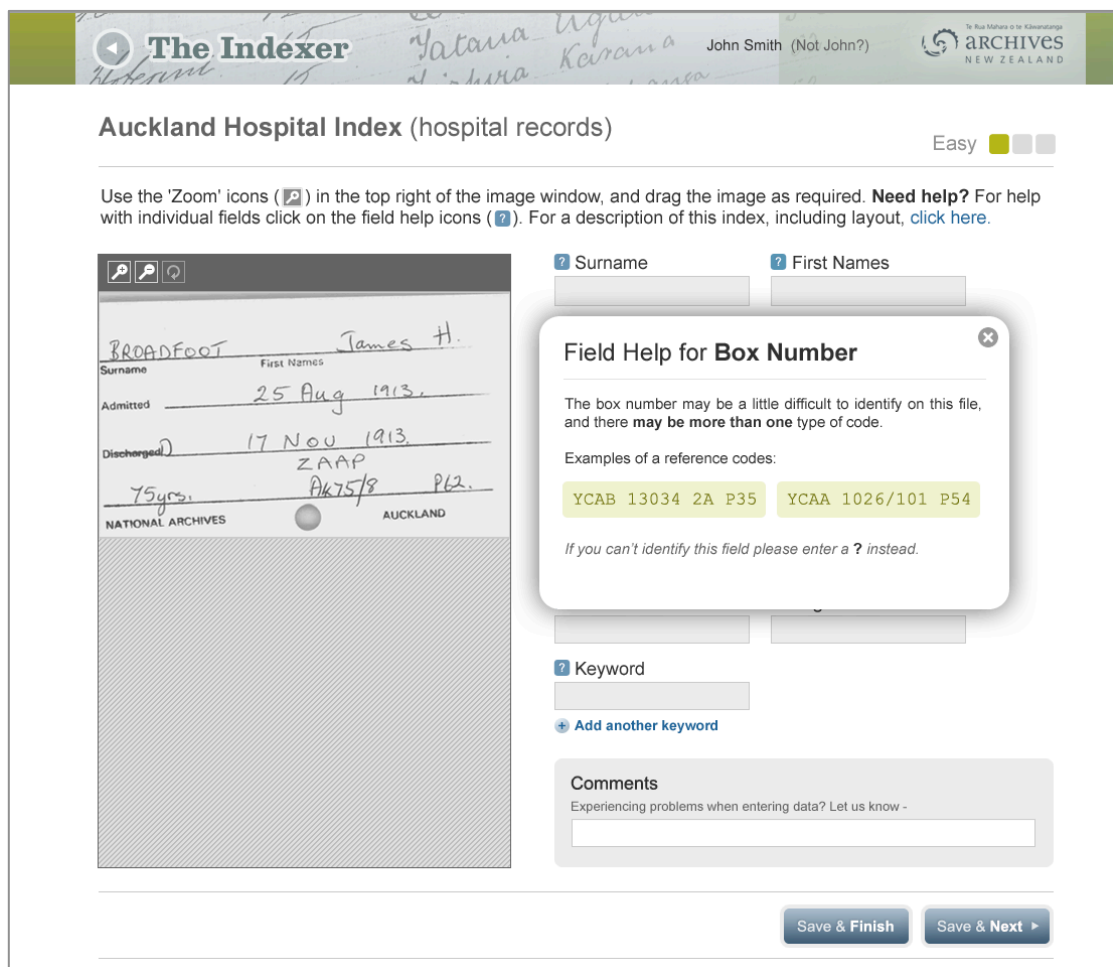


Figure 9 The Indexer - help icon/help box

¹⁰ 'Above the fold' is the top section of a webpage, which can be viewed without scrolling.

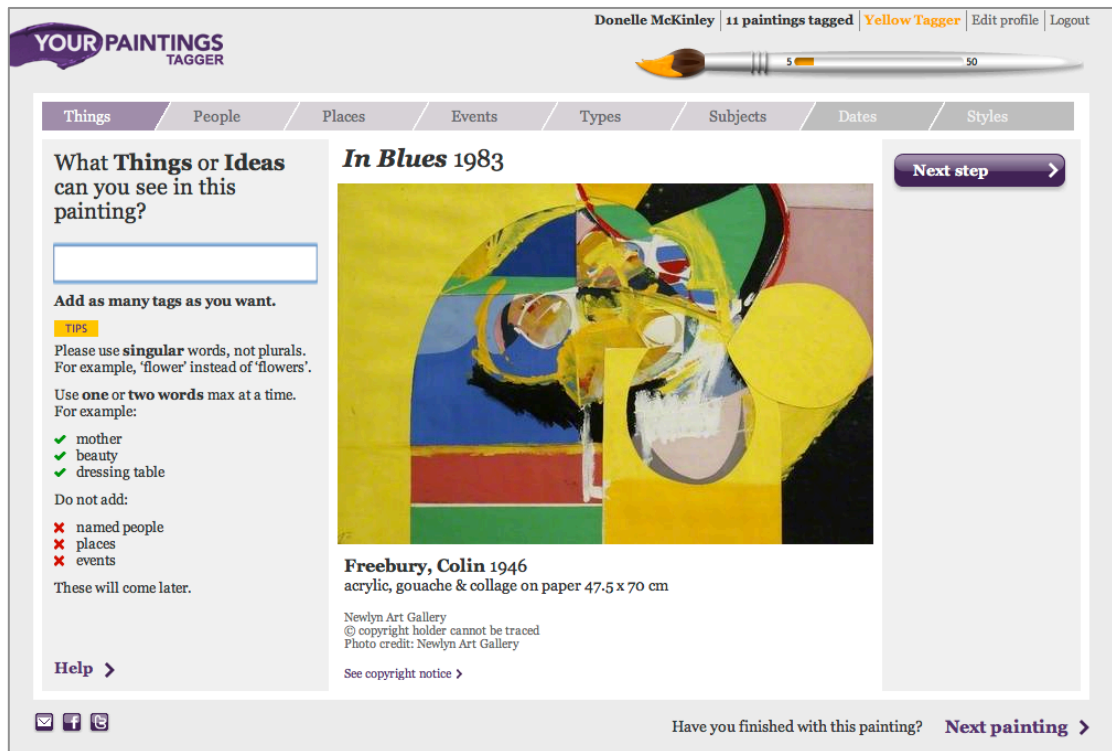


Figure 10 Your Paintings Tagger – alternative design to one-page form

Presentation: Presenting genre/subject matter options alphabetically might better aid selection. Presenting “Type of experience” options as a single vertical list, and removing “unknown” may help to make this sub-section more easily understood. Alternatively, each part of the question could be presented separately. For example, was the reader reading silently or aloud? Was the reader solitary or in company? Was the reading experience a single event or a serial event?

Readability: The small font used for body text in UK-RED form should be retained, and replace the x-small font used elsewhere. Coloured text should be kept to minimum, and used for section and sub-section headings only. Bold font could be used for field names if necessary. Instructions at the end of sections could be highlighted with a box or icon. Readability might also be aided by using background colours that are less demanding. The examination of recent crowdsourcing interfaces found that black or grey text on white, against a white or very pale background is the current trend, and key information is often highlighted with white text against a coloured background (see Figures 9-12).

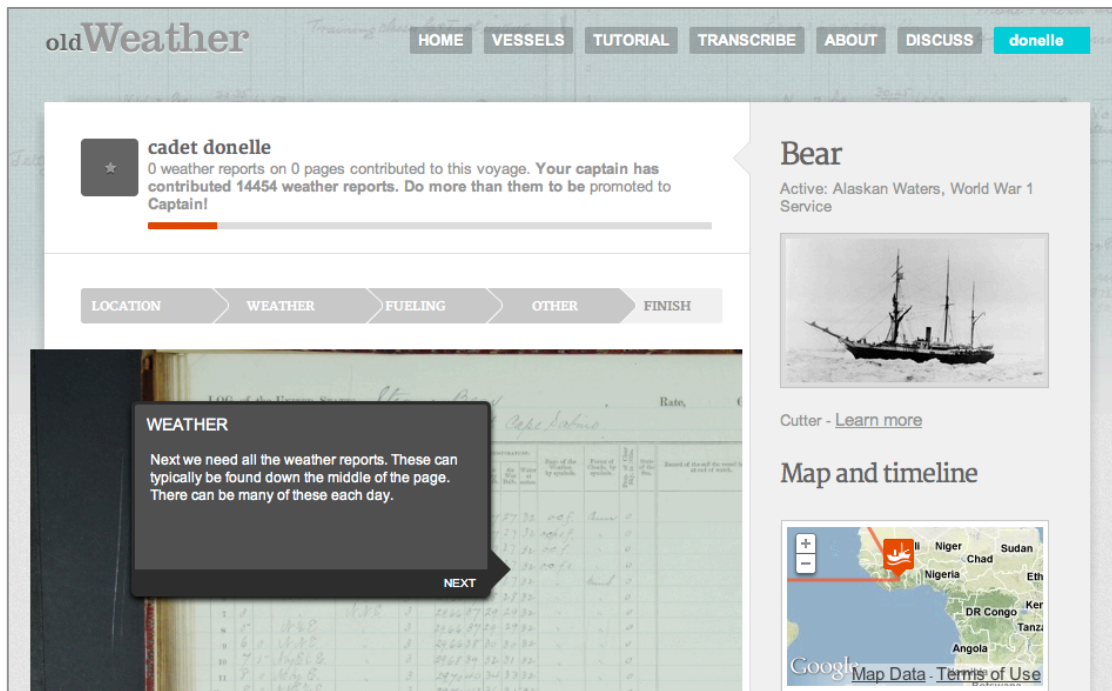


Figure 11 Old Weather - text and background colour for readability



Figure 12 What's the Score at the Bodleian? - text and background colour for readability

Language: As aforementioned, presenting “Type of Experience options” as questions might counter potential user confusion. Provenance could be replaced with a term or phrase more widely understood such as ‘ownership’. It needs to be clarified whether source manuscript “title” refers to the title of the item or the archival collection (McKinley, 2012g). The term “radio button” is used in superfluous text instructions that could be removed; ensuring that the correct radio button is selected before users submit the form because “text entered in fields where no radio button has been

selected will not be submitted to the database” could be managed via automatic mandatory field error feedback prior to submission. The review page could be simply titled “Review”, and the instruction to “save” the reviewed record could be replaced with an alternative such as submit, finish or complete.

Evaluation criteria: Interviews with potential users in the alpha-testing phase could include a scale to indicate the time required to familiarise themselves with the task, followed by a question about whether or not this is an acceptable time frame. A survey of NZ-RED beta version users shall find that the task interface enabled the majority of respondents to quickly understand what the task involves quickly and easily, based on the acceptable time frame established in the alpha-testing phase.

Implication: New visitors who do not quickly understand what the task involves may be deterred from participating, and new contributors may experience frustration without the necessary data at hand.

4.4 Requirement #4

Description: The task interface shall support accurate and controlled data entry

Type: Functionality

Motivation: Support rich data collection

Rationale: Accurate, consistent, and disambiguated data is essential for the validity of the NZ-RED and the research it informs. Those aspects of the task that are not supported by the task interface will fall to the project team, which impacts on limited project resources.

Basis for rationale: The quality of crowdsourced data is a primary concern for cultural heritage and Digital Humanities project teams (Oomen & Aroyo, 2011; Ridge, 2012; Rockwell, 2012). A member of the UK-RED project team checks every record for accuracy before it is made publicly available (Crone et al., 2011, pp. 429–431), and the team has spent considerable time cleaning up data, specifically disambiguating and normalising titles and names of readers/listeners (Towheed, 2012). The UK-RED project team has also included a volunteer support person, who aimed to respond within twelve hours to the many questions asked by new contributors in order to maintain volunteer momentum (K. Halsey, personal communication, May 18, 2012 and November 13, 2012).

Extent to which UK-RED meets requirement: Partially

Task instructions: One survey respondent commented that it was not clear whether the contribution form could be used to record more than one reading experience from a single source, which is a high-priority issue. With regard to presentation of instructions, the heuristic evaluation noted that task interface instructions include some but not all the information available on the separate Notes (guidelines) page, as well as links to Notes, which may be confusing for users. Similarly, a survey respondent commented that it was disorientating to click on an external link to view Notes. These were considered minor issues. The UK-RED contributors who responded to the survey were asked how often they referred to the detailed notes available on the separate webpage. The majority (56%) do not refer to them often, but 31% refer to them regularly, which suggests that the presentation issues identified

could be affecting a significant proportion of users. Results of the 2007 UK-RED questionnaire included several suggestions for improvements to task instructions that have not been implemented (“Breakdown of results of first RED trial,” 2007). Respondents asked for advice about entering and formatting names that have changed (as in the case of a single woman who later marries), and title variations (as in the case of a quoted title differing from a published title). Advice and descriptions were also requested for the options related to provenance and socio-economic group.

Authority control and controlled vocabulary: While the UK-RED task interface effectively breaks down data into clearly distinct units, and provides day and month selection boxes to minimize input format issues, it does not include any authority control functionality to normalize or disambiguate data entered. The heuristic evaluation identified the absence of controlled vocabulary (in the form of drop-down lists or predictive text) for country of origin, country of experience and religion as a minor issue, which was also noted by a survey respondent.

Suggested actions:

Task instructions: The task interface needs to instruct users that reading experiences from the same source must be recorded separately. Instructions also need to address the inputting and formatting of name and title variations, and the options for provenance and socio-economic group. ‘Contribute Notes’ could be revised to be more concise, and fully integrated into the task interface as ‘click to show’ instructions alongside relevant fields. Alternatively, text instructions could be presented alongside relevant fields if each stage of the task is presented in a separate screen (see Figure 13). It may also be useful to make full instructions available as a downloadable PDF for users working offline.

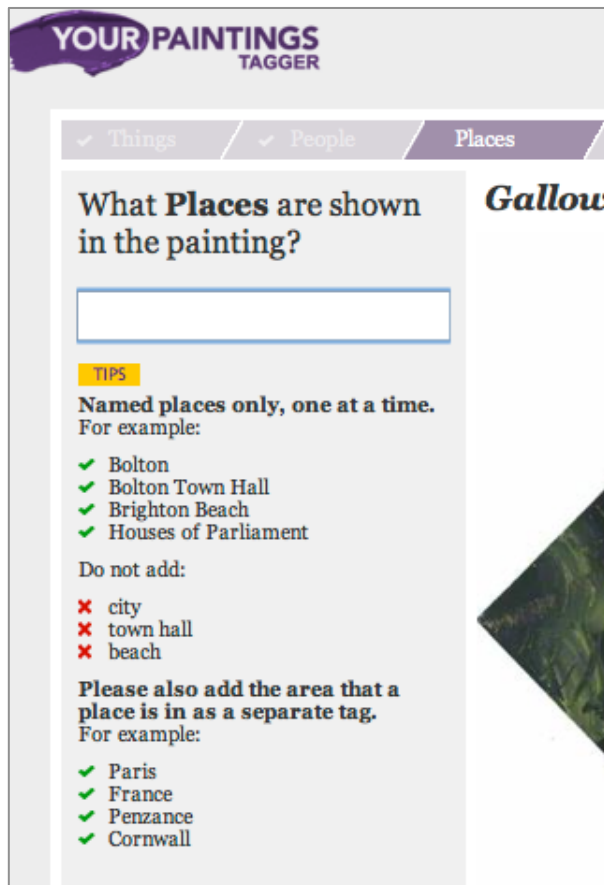


Figure 13 Your Paintings Tagger - task instructions

Authority control and controlled vocabulary: Dropdown lists/predictive text could be used for country of origin, country of experience, religion, socio-economic group, place of publication, and place of experience based on controlled vocabularies. Dropdown lists/predictive text could potentially be extended to names, titles, and occupations based on existing database content or controlled vocabularies drawn from authoritative sources. Examples of other crowdsourcing projects using this approach include Your Paintings Tagger, which uses pre-emptive drop-down menus based on Oxford University Press sources to support data disambiguation and accurate data entry (see Figure 14), and What's on the Menu (see Figure 15).

YOUR PAINTINGS TAGGER

Donelle McKinley | 16 paintings tagged | Yellow Tagger | Edit profile | Logout

Things | People | Places | Events | Types | Subjects | Dates | Styles

What Things or Ideas can you see in this painting?

plan

Can you find a thing or idea from the list below (preferred option)? If so, please click on it. © Oxford University Press 2008.

- plan** – plan, plans (a detailed proposal for doing or achieving something.)
- plan** – plan, plans, planned, planning (decide on and make arrangements for in advance.)
- plane** – plane, planes (a flat surface on which a straight line joining any two points on it would wholly lie.)
- plane** – plane, planes (an aeroplane.)
- plane** – plane, planes (a tool consisting of a block with a projecting steel blade.)
- plane** – plane, planes (a tall spreading tree of the northern hemisphere, with maple-like leaves and bark which peels in uneven patches.)
- planet** – planet, planets (a celestial body moving in an elliptical orbit round a star.)
- plant** – plant, plants (a living organism of the kind exemplified by trees, shrubs, herbs...)

Can't find what you're looking for? Click here to close the list, continue typing your own thing or idea and then press enter.

Fraser, Alexander 1940
oil on canvas 132 x 142 cm
Aberdeen Art Gallery & Museums
© the artist
Photo credit: Aberdeen Art Gallery & Museums Collections

Help >

Next step >

Figure 14 Your Paintings Tagger - data disambiguation

NYPL Labs

What's on the menu?

Search keyword(s) Go

Menus | Dishes | Data | Blog | About | Help

Orange Marmalade

Orange Jam

Orange Juice

Orange Marmalade

This is my best guess (text is not 100% readable)

Enter dish or Cancel

Delete this dish

Figure 15 What's on the Menu? - predictive text

Evaluation criteria: A heuristic evaluation of the NZ-RED beta version will not identify any potential usability issues related to controlled vocabulary, authority control or task instructions. This will be supported by a survey of NZ-RED beta version users that does not identify any issues related to controlled vocabulary or authority control, and shows that task instructions are meeting user needs efficiently and effectively for 80% of respondents. NZ-RED project reports will show that minimal project resources are required to normalize and disambiguate data, and respond to volunteer queries that relate to data entry.

Implication: Inaccurate, inconsistent, and ambiguous data would negatively impact on the validity of the NZ-RED and, subsequently, use by researchers. Relying on the project team to clean up data and respond to user queries means there are less resources available for other aspects of project management, such as website optimization and project promotion.

4.5 Requirement #5

Description: The task interface shall be easy to use for people reasonably confident with the Web

Type: Usability

Motivation: Support volunteer participation

Rationale: Approximately half of NZ-RED contributors are likely to be only reasonably confident using the Web.

Basis for rationale: Asked about their level of confidence using the Web, 52% of survey respondents indicated that they are reasonably confident, and 47% very confident. Cross tabulation of this data with the age range of respondents suggests that those currently over 46 years of age (60% of respondents) are more likely to describe themselves as reasonably confident than very confident. The task interface needs to cater to users with varying levels of confidence with the Web.

Extent to which UK-RED meets requirement: Partially

General ease of use: Of all survey respondents, 8% have used the UK-RED task interface once, 14% have used it a few times, and 11% have used it many times. Asked to indicate how easy the UK-RED task interface is to use, 23% of contributors who responded described it as easy and 71% as manageable. Cross tabulation of this data shows no direct correlation between frequency of use and ease of use. Furthermore, the majority of contributors who are very confident using the Web described the form as manageable rather than easy.

Explanations of interactive elements: The heuristic evaluation identified a potentially major usability issue concerning explanations of how interactive elements work and why things are happening. The explanation of the process from data entry to submission is presented in text form only at the end of the lengthy “Notes” page without a heading, and could easily be overlooked by users. Relevant text instructions in the task interface itself are presented throughout the page both in-line and as hyperlinks to “Notes”. This approach to instruction lacks cohesion and may be overwhelming or confusing for new users only moderately confident with the Web,

who might be better supported by a visual demonstration of the interactive elements in action during data entry, review and submission.

Feedback: The task interface provides some feedback on user actions and systems progress, but the heuristic evaluation identified scope for improvement. Users attempting to submit the form without completing compulsory fields are presented with a pop up that describes the field to be completed, and auto-navigates them to the relevant field. The page changes colour in Review mode, and an automated email confirms the record has been successfully submitted. However, it was noted that clicking Enter on the keyboard performs the Submit function; if users were to do this inadvertently or instead of clicking Tab between fields, this would cause confusion. Error messages (“Mandatory field: firstname must be filled in”) and confirmation emails (only containing contributor name, email, and record ID) could be improved by using personal and encouraging language. These were considered minor issues. One survey respondent commented that clicking the Back button loses any data entered, although this was not the researcher’s experience. If this is a possibility, there was no pop-up to inform the user accordingly, which is a major issue.

Clarity and purpose of interactive elements: The heuristic evaluation identified two minor issues concerning the clarity and purpose of interactive elements. Underlined bold red text is used for both hyperlinks and text with hover boxes, so it is not clear what users should expect. For example, clicking on hover text links returns the user to the top of page, which is confusing. Also, the “Type of experience” subsection uses square multiple-choice buttons for single choice answers, which does not follow standard convention. A survey respondent commented that the combination of round and square buttons is visually and conceptually confusing.

Suggested actions:

Explanations of interactive elements: The examination of other crowdsourcing interfaces suggested that users might be better supported with a video and/or screenshot walk-through that explains the overall organization of the task interface and demonstrates the interactive elements in action. The home page of Your Paintings Tagger includes an excellent four-minute video tutorial, which explains the purpose of the task and walks through each stage in real time. A similar video tutorial on the

NZ-RED home page could be linked to from the task interface. Zooniverse projects such as Old Weather, Seafloor Explorer, and Snapshot Serengeti welcome new users and walk them through screen-by-screen tutorials, presenting instructions in small chunks at the user's own pace (see Figure 16).

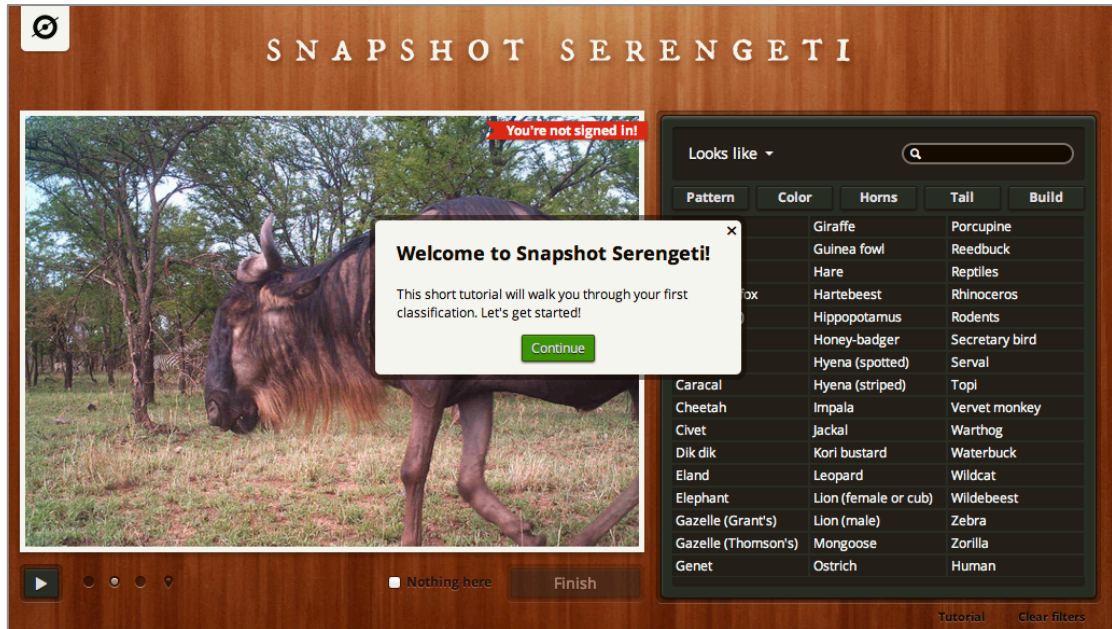


Figure 16 Snapshot Serengeti - user tutorial

Feedback: If necessary, pop-ups asking users to confirm their wish to navigate away from an incomplete record or submit a record could be instated. Pop-ups that describe user errors and navigate to the relevant field could be retained, using more personal and encouraging language. For example, “Oops! You’ve missed an important step. Please fill in [field]. Thanks!”. Automated emails confirming successful submission could also be improved by automating personal greetings (Hi [first_name]), thanking users for their effort, and acknowledging the importance of their participation. Changing page colour to indicate “Review” mode is appropriate, but this could be also achieved in other ways, such as the banners at the top of the screen used for What’s on the Menu? (see Figure 17). The examination of other crowdsourcing interfaces also suggested ways in which the interface might provide feedback on user progress. What’s on the Menu? uses ticks to indicate completed fields (see Figure 17), What’s the Score at the Bodleian uses a box in the margin to summarize completed

fields (see Figure 18), similar to Your Paintings Tagger (see Figure 19). Any of these approaches could be adapted depending on the page design of the NZ-RED.

The screenshot shows a web application titled "What's on the menu? Menu". At the top, there is a search bar with the text "Search keyword(s)" and a "Go" button. Below the search bar is a navigation menu with items: "Menu", "Dishes", "Data", "Blog", "About", and "Help". The main content area is titled "Weinkruger" and contains a list of dishes with their prices. A "Transcribe this menu!" button is located on the right side of the menu. The interface also includes a "Fully reviewed? Mark as done" indicator and a "Update Review" button.

Dish	Price
Schnecken In Weissbrot Mit Pikanter Kräuterbutter Überbacken	11.5
Tomatencremesuppe Mit Einem Schuss Wacholderschnaps Und Sahnehäubchen	6.8
Kartoffelpuffer Mit Schinken Und Geschmolzenem Käse	8.5
Feine Radieschenblattersuppe	6.0
Zwiebelsuppe Riesling Mit Käse Überbacken	5.9
Ulmer Zwiebelfladen	5.5
Kasesuppe In Der Brottasse	6.5

Figure 17 What's on the Menu? – review

The screenshot shows a web application titled "What's the Score at the Bodleian?". At the top, there is a navigation bar with items: "Start describing", "My descriptions", "Browse scores", "Guidelines", "Blog", and "FAQ". A dropdown menu shows "donele". The main content area shows a score card for "SHE WORE A WREATH OF ROSES" by J.P. KNIGHT, FOR THE PIANO BY JULES ROCHARD. The interface includes a "Descriptions:" section with fields for Publication, Creator, Title, and a "Show/Hide" button.

Figure 18 What's the Score at the Bodleian? - description summary

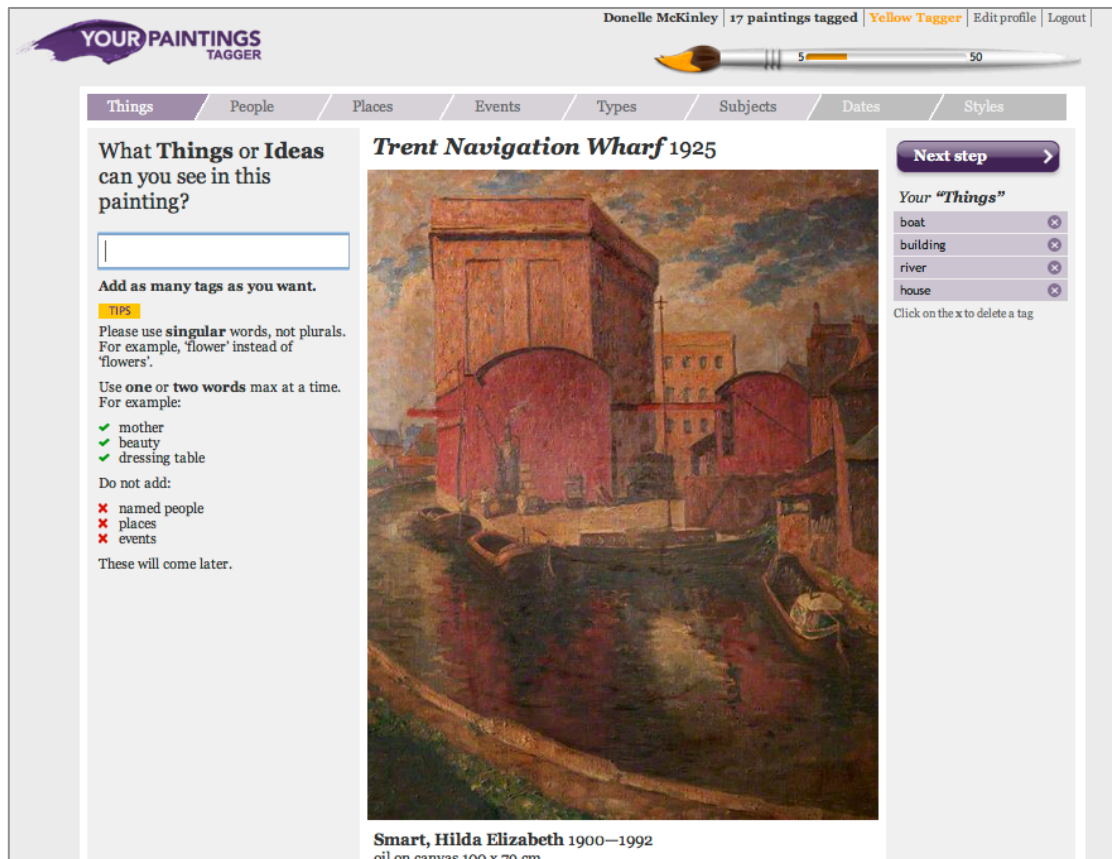


Figure 19 Your Paintings Tagger - tag summary

Clarity and purpose of interactive elements: To avoid user confusion, the colour used for hyperlinked text should not be used for other interactive elements. Regarding the options for “Century of experience” and “Type of experience”, Web convention dictates that radio buttons (circles) should be used for single-choice options, checkboxes (squares) for multiple-choice options. Both should function accordingly.

Evaluation criteria: A survey of NZ-RED beta version users will find that 70% of all respondents and the majority of respondents only moderately confident with the Web find the task interface easy to use. Cross tabulation of survey data will show a direct correlation between frequency of use and ease of use.

Implication: A task interface that does not cater for users with varying levels of confidence with the Web will impact negatively on user recruitment and participation.

4.6 Requirement #6

Description: The task interface shall support flexible, structured data entry

Type: Functionality

Motivation: Support rich data collection

Rationale: Enabling users to enter all relevant data in a flexible, structured format will optimize records for search.

Basis for rationale: As the NZ-RED will collect reading experiences up to the present day the task interface needs to support more flexible data entry than the print/manuscript-focused UK-RED, which cuts off at 1945. For example, the interface needs to effectively and efficiently capture contemporary reading experiences recorded in digital formats such as emails, ebooks, blog posts, social network posts, and online book club communications. NZ-RED needs assessment documentation also includes a requirement for capturing multiple authors/editors, readers, listeners and groups (Shep, Norrish, McKinley, & Liebich, 2012, p.4). Data entered into free text fields cannot be faceted, which limits the visibility and usefulness of the data.¹¹ Therefore, the interface needs to enable users to add structured fields as needed.

Extent to which UK-RED meets requirement: Does not meet requirement.

The heuristic evaluation identified several potential usability issues relating to the provision of a logical and complete set of options. The sub-section “Source for the reading experience” captures data with structured fields for print and manuscript sources, but “other” sources are recorded in a free text box. While this is likely to be a low-priority issue for the UK-RED, it is high-priority for the NZ-RED. The sub-section “Publication details” also requires users to enter data into a free text box rather than structured fields. Another high-priority issue concerns the sub-section “Who was involved”, which captures distinct units of data for only one reader/listener. Users with information about additional readers/listeners input data into a free text field. A survey respondent identified another major issue related to the sub-section “Who was involved”: the task interface does not capture specific units of

¹¹ Faceted search/browsing relies on metadata indexes to provide various ways of grouping and filtering search results (Taylor & Joudrey, 2009, p.174). For example, a user might search the NZ-RED by text read and filter results by country of experience.

data for both readers and listeners. The user is required to select reader, listener, or reading group, and any additional details must be entered in a free text box. Other survey respondents commented that the form does not capture honorifics, and that broad categories such as fiction cannot be narrowed down.

Suggested actions:

A flexible, structured approach to data capture was observed during the course of research, which could be adapted for the NZ-RED. The open source bibliographic software Zotero enables users to select record types from drop-down menus, and displays the relevant fields beneath. Users can add or remove fields as required (see Figure 20). This approach could potentially replace some of the static fields currently used in the UK-RED form, and address the requirement for multiple authors/editors, readers, listeners and groups. The Indexer also enables users to add extra fields as needed (see Keyword field in Figure 9).

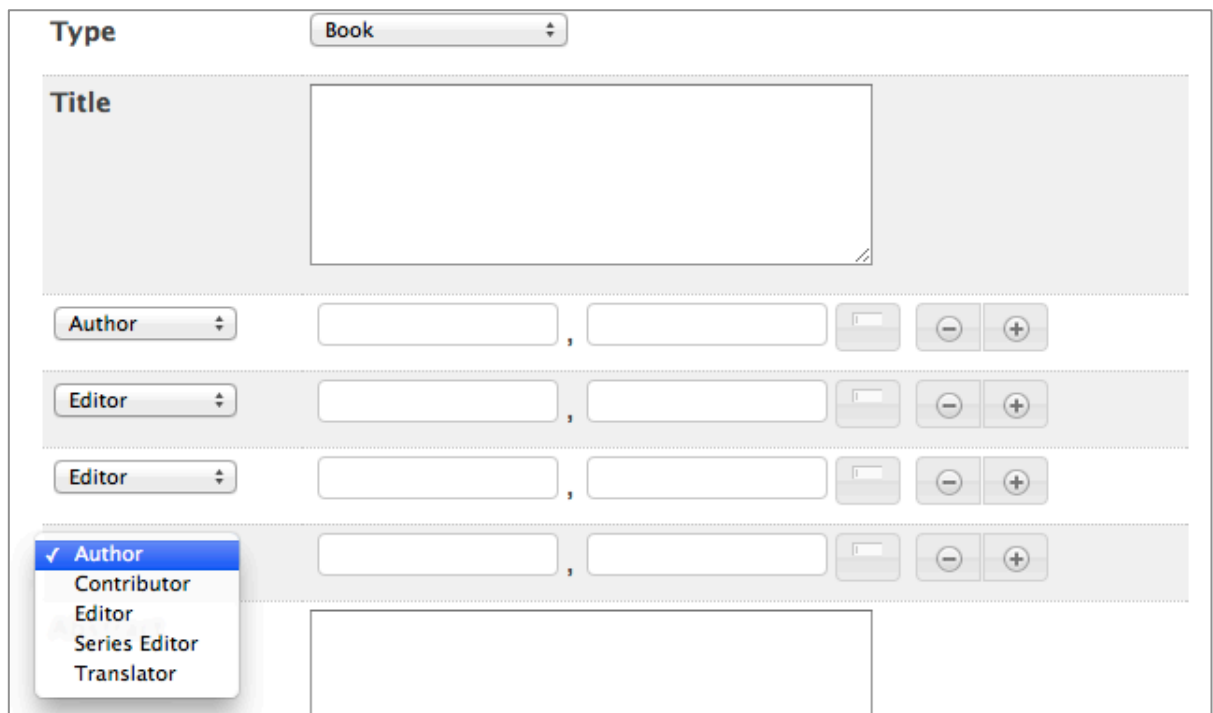


Figure 20 Zotero - add and select fields

NZ-RED project meeting minutes include a further suggestion to support flexible, structured data entry. Prior to the “Additional Comments” free text field at the end of each record, users could be given the option to add other structured fields, such as links to RED records or external webpages that relate to the record being created (McKinley, 2012d, p.2). This function could be available even after the record is published. This would enrich records for researchers using the NZ-RED as a method of personal data collection, as well as researchers and other users browsing and searching the database.

Evaluation criteria: A heuristic evaluation of the NZ-RED beta version will not identify any potential usability issues related to flexible, structured data entry. This will be supported by a survey of NZ-RED beta version users that not identify any issues related to flexible, structured data entry, and shows that these functions are efficiently and effectively meeting the needs of 80% of respondents. NZ-RED project reports will show that minimal project resources are required to edit or manually format data entered into free text fields.

Conflicts: Functionality that supports flexible, structured data entry has the potential to negatively impact on the following requirements if not effectively user-tested:

- Requirement #1: The task interface shall minimize user effort
- Requirement #3: The task interface shall enable new visitors and contributors to understand what the task involves quickly and easily
- Requirement #4: The task interface shall support accurate and controlled data entry
- Requirement #5: The task interface shall be easy to use for people reasonably confident with the Web

Implication: Data collected by users may not be entered if the task interface does not support its capture. Data entered in free text fields may be overlooked by search results.

4.7 Requirement #7

Description: The task interface shall support bilingual data entry

Type: Functionality

Motivation: Support volunteer participation and rich data collection

Rationale: Māori and English are official languages of New Zealand and need to be supported in order to accurately capture New Zealand reading experiences.

Basis for rationale: As Marcus and Gould (2012, p. 341) explain, appropriate localization of a user interface often combines partially universal and partially local solutions, based on user needs. Universally, “language is intrinsic to expressing and sustaining culture as a means of communicating values, beliefs, and customs. As the indigenous culture of New Zealand, Māori culture is unique to New Zealand and forms a fundamental part of the national identity. Māori language is central to Māori culture and an important aspect of cultural participation and identity.” (Statistics New Zealand, 2010). NZ-RED needs assessment documentation includes a requirement for bilingual capabilities, such as using terms in both Māori and English to represent the type of reading experience data being collected (Shep et. al, 2012, p.2).

Extent to which UK-RED meets requirement: Does not meet requirement.

The “Evidence of the reading experience” sub-section enables users to enter a reading experience recorded in another language using a free text box. One survey respondent commented that there needs to be a more reliable way to enter a reading experience in languages other than English to better support search. Others suggested tagging the language in the evidence box, and the language of the text and reader.

Suggested actions:

Presentation: In the absence of comparable projects in New Zealand, the websites of Te Papa Tongarewa Museum of New Zealand, Te Ara Encyclopedia of New Zealand, and the Alexander Turnbull Library suggest two approaches for presenting bilingual text: English text alongside the Māori translation (see Figure 21) and a function that toggles between English and Māori (see Figure 22 and Figure 23). The most suitable approach for the NZ-RED depends on the outcome of further research, which is

needed to determine how accurately the reading experience terms in Māori map to those in English. The impact of bilingual data entry on the presentation of NZ-RED search results also needs to be taken into account. NZ-RED project meeting minutes suggest that full translation of task instructions may be unnecessary, which is supported by the fact that over 95% of New Zealanders speak English (“QuickStats”, 2006).

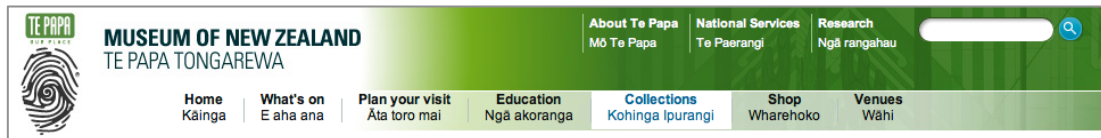


Figure 21 Te Papa - English and Māori



Figure 22 Te Ara – English or Māori

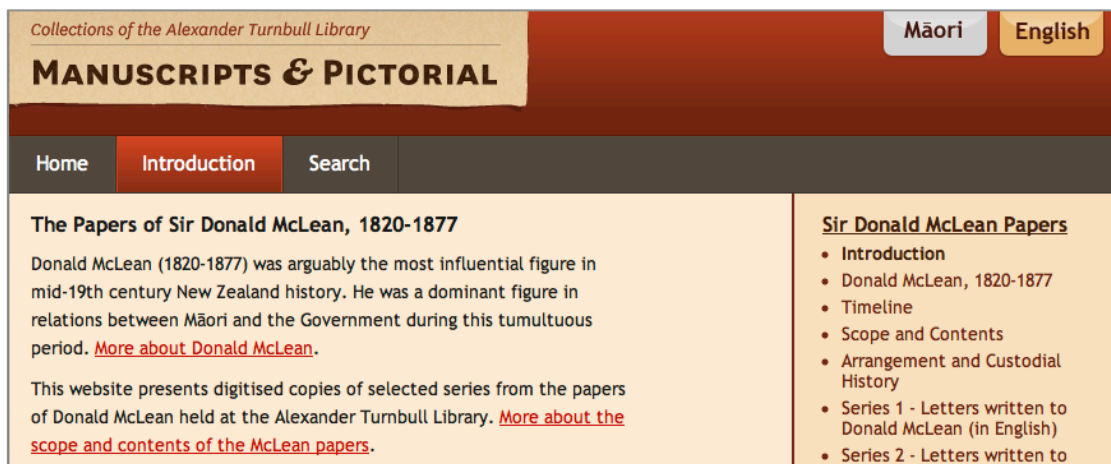


Figure 23 Alexander Turnbull Library – English or Māori

Macrons: In the Māori language the macron is commonly used to mark long vowels, although double vowels have also been used. The NZ-RED needs to support UTF-8 encoding, which can represent every character in the Unicode character set, including true macrons, without the need for Māori fonts (“Macron issues”, n.d.).

Evaluation criteria: Potential NZ-RED contributors working with Māori material will be consulted during the development phase in order to understand their needs and objectives, and involved in user testing to ensure the task interface reflects those needs and objectives. Potential NZ-RED contributors *not* working with Māori material will also be involved in user testing to ensure bilingual functionality does not negatively impact on their ability to effectively and efficiently complete the task. A heuristics evaluation and survey of beta version users shall not identify any issues related to bilingual functionality, which negatively impact on the users’ ability to effectively and efficiently complete the task.

Conflicts: Functionality that supports bilingual data entry has the potential to negatively impact on the following requirements if not effectively user-tested:

- Requirement #1: The task interface shall minimize user effort
- Requirement #3: The task interface shall enable new visitors and contributors to understand what the task involves quickly and easily
- Requirement #4: The task interface shall support accurate and controlled data entry
- Requirement #5: The task interface shall be easy to use for people reasonably confident with the Web

Implication: A NZ-RED task interface that does not support bilingual data entry impacts on the validity of the NZ-RED as an accurate, representative resource.

5 Conclusion

Seven functionality and usability requirements for a NZ-RED task interface that supports volunteer participation and rich data collection were established in the course of this research: minimize user effort; support integration of the task with research processes; enable new visitors and contributors to understand what the task involves quickly and easily; support accurate and controlled data entry; be easy to use for people reasonably confident with the Web; support flexible, structured data entry; and support bilingual data entry. The rationale and evidence that supports them suggests that many, and in some cases, all requirements will also be applicable to World-RED partners; if this is the case, a collaborative approach to task interface design may be appropriate.

The UK-RED task interface partially meets four of the seven requirements; it does not support integration of the task with research processes, flexible, structured data entry or bilingual data entry. The limitations of the UK-RED template identified in this study were predominantly related to interactivity, which is partially symptomatic of its age; since the launch of the UK-RED redesign in 2009, website design has evolved, as exemplified by the heuristics used and crowdsourcing projects examined in this study. The UK-RED's limitations are also partially due to the overall approach to design, which is based on the original double-sided A4 document; as Watzmann & Re (2012, p.337) explain, "transitioning a print document to an online environment requires rethinking how the document is presented". The examination of recent crowdsourcing projects has suggested some alternative approaches, which might better serve NZ-RED user needs and project objectives. A range of other suggested actions have been drawn from the results of the heuristic evaluation and survey, project documentation, and human-computer interaction literature, to address those aspects of the UK-RED task interface template that do not meet requirements. At this point it should be emphasized that the design of the task interface needs to be consistent with the rest of the website, and as such must be approached holistically (Powazek, 2002, p.40, Watzmann & Re, 2012, p.337). The next stage of the NZ-RED project will involve the production of a series of wireframes,¹² following consultation with the project team about the feasibility of suggested actions. The wireframes will

¹² A wireframe is a visual representation of a website's framework

inform the development of a working task interface prototype, which will undergo user testing before being incorporated into the overall NZ-RED website design.

The time and expertise required to establish evidence-based requirements may seem to be beyond the capabilities of crowdsourcing projects with limited resources. However, investing in the establishment of evidence-based requirements could prove to be cost-effective in the long-term, by informing task interface design that leverages the initial momentum of the project, and contributing to its social sustainability. Publication of internal requirements documentation could help to inform the requirements activity of other projects, thereby reducing the time and expertise required over time. With this in mind, future research could review the requirements established by this study, and consider their value for the NZ-RED, World-RED partners and other crowdsourcing projects.

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8 Appendices

A. Structure of the UK-RED contribution form

Section	Sub-sections
1	<ol style="list-style-type: none">1. Contributor name and email (required)2. Evidence of the reading experience (required)3. Source for the reading experience (required)4. Century/date of the reading experience5. Information about the reader/listener/reading group6. Information about the text being read
2	<ol style="list-style-type: none">1. Form of text being read2. Publication details3. Provenance
3	<ol style="list-style-type: none">1. Date of birth of reader/listener2. Socio-economic group of reader/listener3. Occupation of reader/listener4. Religion of reader/listener5. Country of origin of reader/listener6. Country of experience of reader/listener7. Time of experience of reader/listener8. Place of experience of reader/listener9. Type of experience (reader and/or listener)10. Additional comments

B. Extract from the UK-RED contribution form

4. Century of Reading Experience

Century of Experience: [clear selection](#)

1450 to 1499 1500 to 1599 1600 to 1699 1700 to 1799
 1800 to 1849 1850 to 1899 1900 to 1945 Unknown

Date of Experience (if known):

If you know the exact date of the reading experience, please use the first option ("Exact date") only. If you have a date range, please use the "Date range" option. Follow the link for more detailed guidance.

[View notes](#) [clear selection](#)

Exact Date Date Range Unknown

5. Who was involved

Who was involved in the reading experience? Please select one of the following options and enter the relevant details:

(Note: please ensure that the correct radio button is selected before you submit your form. Text entered in fields where no radio button has been selected will not be submitted to the database)

[View notes](#) [clear selection](#)

Reader Listener Reading Group

Reader: Select this option if you know the identity of the person reading the text - for example, their name or a detailed description

Reader First Name:

Reader Surname:

(If you do not know the name of the reader, enter anon and then enter the further details you know about the person in the sections below)

Reader Age: Child (0-17) Adult (18-100+) Unknown

Reader Gender: Male Female Unknown

Please enter any useful information here about the identity of the reader – for example, their maiden name, any pseudonyms, any family relationships (mother of, father of, son of, etc)

Comments:

If the reader was reading the text aloud, were there any listeners? If so, please enter their names in the Listener Details box below.

Listener Details:

(If you do not know the names of the listeners, you can enter a description, e.g. servants, or classmates)

C. Survey Information Sheet



SCHOOL OF INFORMATION MANAGEMENT
TE KURA TIAKI, WHAKAWHITI KŌRERO
LEVEL 5, RUTHERFORD HOUSE, PIPITEA CAMPUS, 23 LAMBTON QUAY, WELLINGTON
PO Box 600, Wellington 6140, New Zealand
Phone +64-4-463 5103 Fax +64-4-463 5446 Email sim@vuw.ac.nz Website www.victoria.ac.nz/sim

Information Sheet for Participants for a Study on the Reading Experience Database

Project Title: 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 (NZ-RED)

Researcher: Donelle McKinley, Department of Information Studies, School of Information Management, Victoria University of Wellington

I am a Master of Information Studies (MIS) student at Victoria University of Wellington, New Zealand, and a member of the Wai-te-ata Press research team. Wai-te-ata Press is one of four international partners collaborating on a World Reading Experience Database (World-RED) with the Open University, UK. As part of my degree, I am undertaking a research project that focuses on the web interface used by RED contributors.

You are invited to participate in a brief online survey that aims to understand the needs and objectives of RED contributors, discover how effectively the UK-RED interface supports rich data collection and volunteer participation, and identify some alternative approaches to interface design that might better support rich data collection and volunteer participation.

While directly contributing to the development of the NZ-RED, this study will be of value to the UK-RED project team, who are investigating a revised RED model, and World-RED project partners, who are in the early stages of development. The study will also contribute to the strategic planning, development and evaluation of other academic and cultural heritage projects involving volunteers.

The survey is strictly anonymous and will take approximately five minutes to complete. This project has been granted ethical approval by the Victoria University of Wellington Human Ethics Committee. Your participation implies that you consent for me to use your responses in the research project. Any personal information will be collected for statistical reasons only and no identities will be associated with any responses. The collected data will be stored in a password-protected file for the duration of this study.

The research report will be submitted for marking to Victoria University of Wellington and deposited in the University Library, after which it will become available electronically. I also intend to publish articles based on the data in scholarly journals. A summary of the research findings will be made available on the NZ-RED research blog <http://nzredblog.wordpress.com> in March 2013. The collected data will be destroyed two years after the conclusion of the research.

Should you require further details regarding this project, please do not hesitate to contact either:

Researcher: Donelle McKinley donelle.mckinley@vuw.ac.nz

Supervisor: Dr Sydney Shep sydney.shep@vuw.ac.nz

D. Survey questions

RED contribution form design

Survey for current and potential RED contributors

<http://www.open.ac.uk/Arts/reading/UK/contribute.php>

1. Where do you reside?

- Australia
- Canada
- Netherlands
- New Zealand
- UK
- USA
- Other (text field)

2. What is your occupation? (former occupation if retired)

- Academic
- Teacher
- Library/Archives/Museum professional
- Independent researcher
- Postgraduate student
- Undergraduate student
- Other (text field)

3. Please indicate your age range:

- 15-25
- 26-35
- 36-45
- 46-55
- 56-65
- 66-75
- 75+

4. Gender

- Female
- Male

- 5. What is the main focus of your reading or research?**
- History of reading
 - History of the book
 - History (other)
 - Literature
 - Other
- 6. What is your primary method of sourcing reading experiences?**
- I discover reading experiences in the course of my own reading/research
 - I seek out sources that might contain reading experiences for the purpose of adding to the RED
 - Other
- 7. Do you (or might you) use a RED for your own research purposes?**
- Yes
 - No
 - Maybe
- 8. How would you describe your level of confidence using the Web?**
- Not very confident
 - Reasonably confident
 - Very confident
- 9. What is your overall impression of the RED contribution form? (select as many as required)**
- It is logically organised
 - It could be better organised
 - It is a manageable length
 - It is too long
 - It is easy to read
 - It is somewhat difficult to read
 - It is easy to understand
 - Some parts appear difficult to understand
 - Other (text field)
- 10. Are there any sections, fields, categories or options you would expect to see that are not included?**

11. How often have you used the RED contribution form?

- Never
- Once
- A few times
- Many times

If you have not used the RED contribution form, please go to Question 19

12. If you have used the RED contribution form, how easy is it to use?

- Very difficult to use
- Difficult to use
- Manageable
- Easy to use
- Very easy to use

13. When you are creating a record, how often do you refer to the detailed contribution notes (http://www.open.ac.uk/Arts/reading/UK/contribute_notes.php)?

- Never
- Not often
- Regularly
- Very often
- Always

14. Please describe any difficulties you have experienced using the form, and/or how it might be improved:

15. If you a RED contributor, do you generally:

- Complete the first compulsory section only
- Complete as many of the fields as possible

16. How long does it generally take you to create a reading experience record?

- Less than 10 minutes

- 10-20 minutes
- 20-30 minutes
- Longer than 30 minutes

17. How do you typically add new records?

- I add new reading experiences to the database as I find them
- I collect several reading experiences before adding them to the database

Comments:

18. If you no longer contribute to the RED is this because:

- You have completed the relevant project
- You don't have time
- Other (text field)

19. If there are any other aspects of the RED contribution form that you would like to comment on, please do so here:

E. Heuristics (Petrie & Power, 2012)

Heuristic	Description
PHYSICAL PRESENTATION	
Make text and interactive elements large and clear enough	Default and typically rendered sizes of text and interactive elements should be large enough to be easy to read and manipulate.
Make page layout clear	Make sure that the layout of information on the page is clear, easy to read and reflects the organization of the material.
Avoid short time-outs and display times	Provide time-outs that are long enough for users to complete the task comfortably, and if information is displayed for a limited time, make sure it is long enough for users to read comfortably.
Make key content and elements and changes to them salient	Make sure the key content and interactive elements are clearly visible on the page and that changes to the page are clearly indicated.
CONTENT	
Provide relevant and appropriate content	Ensure that content is relevant to users' task and that it is appropriately and respectfully worded.
Provide sufficient but not excessive content	Provide sufficient content (including Help) so that user can complete their task but not excessive amounts of content that they are overwhelmed.
Provide clear terms, abbreviations, avoid jargon	Define all complex terms, jargon and explain abbreviations.
INFORMATION ARCHITECTURE	
Provide clear, well-organized information structures	Provide clear information structures that organize the content on the page and help users complete their task.
INTERACTIVITY	
How and why	Provide users with clear explanations of how the interactivity works and why things are happening.
Clear labels and instructions	Provide clear labels and instructions for all interactive elements. Follow web conventions for labels and instructions (e.g. use of asterisk for mandatory elements).
Avoid duplication/excessive effort by users	Do not ask users to provide the same information more than once and do not ask for excessive effort when this could be achieved more efficiently by the system.
Make input formats clear and easy	Make clear in advance what format of information is required from users. Use input formats that are easy for users, such as words for months rather than numbers.
Provide feedback on user actions and system progress	Provide feedback to users on their actions and if a system process will take time, on its progress.
Make the sequence of interaction logical	Make the sequence of interaction logical for users (e.g. users who are native speakers of European languages typically work down a page from top left to bottom right, so provide the Next button at the bottom right).
Provide a logical and complete set of options	Ensure that any set of options includes all the options users might need and that the set of options will be logical to users.
Follow conventions for interaction	Unless there is a very particular reason not to, follow web and logical conventions in the interaction (e.g. follow a logical tab order between interactive elements).
Provide the interactive functionality users will need and expect	Provide all the interactive functionality that users will need to complete their task and that they would expect in the situation (e.g. is a search needed or provided?).
Indicate if links go to an external site or to another webpage	If a link goes to another website or opens a different type of resource (e.g. PDF document) indicate this in advance.
Interactive and non-interactive elements should be clearly distinguished	Elements which are interactive should be clearly indicated as such, and element which are not interactive should not look interactive.

Group interactive elements clearly and logically	Group interactive elements and the labels and text associated with them in ways that make their functions clear.
Provide informative error messages and error recovery	Provide error messages that explain the problem in the users' language and ways to recover from errors.

F. UK-RED usability inspection results

Heuristic	Potential usability problem + Rating (1-4)
PHYSICAL PRESENTATION	
Make text and interactive elements large and clear enough	Radio button and "view notes" text uses x-small/10pt font size, which may cause difficulty for some users or cause them to be overlooked (2)
	S1/4 and S3/1: Day/month menu boxes are very small, which may cause difficulty for some users (2)
Make page layout clear	Over-use of red for section headings, subheadings, instructions and body text may negatively affect the ability of the user to quickly understand the organization of the form (2)
Make key content and elements and changes to them salient	Using red for headings may be difficult to read for some users (2) Using red h2 text for two sentences of instruction at the end of S1 and S3 may come across as aggressive communication (1)
CONTENT	
Provide relevant and appropriate content	The form includes many fields/options that will not be relevant for every user, which makes the form long and overwhelming (3)
Provide sufficient but not excessive content	Text instructions include some information from Notes but not all, as well as links to Notes, which may be confusing (2)
	Presenting text instructions alongside fields makes the page long, which may be overwhelming, and busy, which may be distracting (3)
	Duplicated content: subheadings and field headings e.g. Provenance, occupation, religion, country of origin, country of experience. This makes the page longer and "busier" than necessary (2)
Provide clear terms, abbreviations, avoid jargon	Provenance may be an unknown term for some contributors, however the options suggest the meaning (2)
	The term "radio button" will not be familiar to some users, and is unnecessary (1)
INFORMATION ARCHITECTURE	
Provide clear, well-organized information structures	Information structure only apparent by scrolling down the full length of the page (2)
	S1/6 Genre/Subject matter: presenting a wide range of options in apparently random order does not aid selection (2)
	Confusing title: On submission, users are presented with a page titled "Contribute Review" (2)
INTERACTIVITY	
How and why	Limited explanation of interactive elements for new users (3) Underlined red body text that includes hover text is not clearly distinguished from hyperlinked text. Not clear what users should expect (2)
Clear labels and instructions	Compulsory fields are not clearly distinguished e.g. by asterisk (2)
	Instruction to "save" reviewed record rather than "submit" is ambiguous, and suggests users may be able to access the saved form (2)

Avoid duplication/excessive effort by users	Requires contributors to enter their name and email address each time, which is an inefficient use of their time on site (2)
	Users can only create a template by duplicating a record at the time of its submission. Records created prior cannot be accessed for this purpose, making for potentially considerable duplication of effort (3)
	Users are instructed to click review again before saving if any changes are made in review mode, which seems an unnecessary additional step (2)
Make input formats clear and easy	
Provide feedback on user actions and system progress	At point of submission neither webpage nor confirmation email acknowledges contributor's effort or explains progress from submission to editing to publishing (3)
Make the sequence of interaction logical	
Provide a logical and complete set of options	S3/9 Type of experience: layout of options makes it unclear how many can be selected (2)
	S1/3 Source (Other): No attempt is made to capture distinct units of data such as author name, title, place or date. Users enter data into a free text field, which is inconsistent with print/manuscript options and doesn't support rich data collection (3)
	S1/5: Who was involved: The form only captures distinct units of data for one reader/listener. Information about additional readers/listeners must be input into a free text field, which is not consistent and doesn't support rich data collection (3)
	S2/2 Publication details of text being read: Users are instructed to enter data into a free text box rather than presented with structured fields, which is inconsistent and doesn't support rich data collection (2)
	S1/4 Century of RE: date ranges are not consistent (2)
Follow conventions for interaction	S3/9 Type of experience: Radio buttons do not follow convention e.g. Multiple choice option for single choice answers (2)
Provide the interactive functionality users will need and expect	Clicking Enter on a keyboard performs the Submit function, which could cause confusion if the form is not yet complete (2)
	Would expect dropdown/predictive text for country and possibly religion, as well as names and titles already in the database for authority control (2)
Indicate if links go to an external site or to another webpage	Underlined bold red text used for hover text and hyperlinks. Clicking on hover text links returns user to top of page - should distinguish between the two (2)
Interactive and non-interactive elements should be clearly distinguished	S1/3 and S1/6 Not clear that underlined bold red headings provide information as hover text
Provide informative error messages and error recovery	Error message uses impersonal language e.g. "Mandatory field: firstname must be filled in" (1)

G. Volere requirements shell (Robertson & Robertson, 2012)

Requirement #	Unique ID
Requirement type	
Description	A one sentence statement of the intention of the requirement
Rationale	A justification of the requirement
Originator	The stakeholder who raised this requirement
Fit criterion	A measurement of the requirement such that it is possible to test if the solution matches the original requirement
Customer satisfaction	Degree of stakeholder happiness if this requirement is successfully implemented
Customer dissatisfaction	Measure of stakeholder unhappiness if this requirement is not part of the final product
Priority	The relative importance of the requirement
Conflicts	Other requirements that cannot be implemented if this one is
Supporting materials	Pointer to documents that illustrate and explain this requirement
History	Creation, changes

Word count: 13,000 approx.