

# **Digital Collections and Web 2.0:**

Investigating adoption & participation

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## **Abstract**

This study explores how cultural heritage institutions (CHIs) have adopted Web 2.0 principles and applications for their digital collections and how users are responding to the Web 2.0-enabled environment in digital collections. The research aims to contribute discussion on whether CHIs have adapted well to the “democratic” nature of Web 2.0. It also aims to contribute discussion on how CHIs can improve their digital collections to better engage with users online. The research used quantitative content analysis to compare the adoption of Web 2.0 applications and principles across archives, libraries and museums and between Australasian and North American CHIs. It also used quantitative content analysis to explore the types of participatory activities offered in Web 2.0-enabled digital collections and the extent to which users have taken advantage of these forms of participation. One particular form of participation, commenting, was investigated using qualitative content analysis, to gain an understanding of how users respond to digital content. The research suggests that libraries are currently leading the adoption of Web 2.0 principles and applications for digital collections. It also appears that Australasian CHIs have been more proactive, compared to their North American counterparts, in making available Web 2.0-enabled digital collections. The research found that CHIs supported a range of different activities in their digital collections but activities encouraging multivocality and user-driven ranking of content were the most popular among both digital collections and their users.

**Keywords:** digital collections, Web 2.0, cultural heritage institutions,

# 1. Introduction

“Web 2.0” is a term used to describe the paradigm shift from a broadcast, or information transmission, model of the web to a more social model that encourages a participatory approach to information communication. Web 2.0 applications have enabled online users to engage in activities such as blogging, tagging, and aggregating content. Cultural heritage institutions, like many other disciplines, have come to recognise that Web 2.0 can offer exciting and new ways of connecting with users. This study explores how cultural heritage institutions (CHIs) have adopted Web 2.0 principles and applications for their digital collections and how users are responding to the Web 2.0-enabled environment in digital collections. The research aims to contribute discussion on whether CHIs have adapted well to the “democratic” nature of Web 2.0. It also aims to contribute discussion on how CHIs can improve their digital collections to better engage with users online.

## 2. Problem Statement

### **2.1. *Rationale***

Kapitzke and Bruce (2006) have said that “bit by bit and brick by brick, online technologies and new media are disassembling the institutional spaces, privileges, powers, and practices of libraries” (p.xiv). In fact in this era of networked digital environment the same applies for all cultural heritage institutions (CHI). One implication of the paradigm shift in terms of how information is delivered has been the proliferation of digitisation initiatives in the cultural heritage domain. CHIs have responded to the increasing popularity of digital content by making digital collections available online.

Along with expectations of digital content, CHIs have also had to recognise the need to change their *modus operandi* regarding how to attract users to their collections. In order to engage with users online some have adopted Web 2.0 applications and principles. This transformation has been likened to “a transition from Acropolis – that inaccessible treasury on the fortified hill – to Agora, a marketplace of ideas offering space for conversation, a forum for civic engagement and debate, and opportunity for a variety of encounters” (Proctor, 2010, p. 36). The intersection of digital collections and Web 2.0 is thus a very relevant topic for the cultural heritage sector currently.

Academic literature addressing the use of Web 2.0 applications and principles by CHIs has only lately started moving beyond conceptual explorations of its meaning, benefits, challenges and implications for the industry. Some quantitative assessments have been conducted to gauge the number of CHIs that have adopted Web 2.0 applications (Chua & Goh, 2010; López, Margapoti, Maragliano, & Bove, 2010; Samouelian, 2009). There have also been case studies exploring the use of specific Web 2.0 applications and principles by CHIs (Krause & Yakel, 2007; Springer, Dulabahn, Michel, Natanson, Reser, Woodard, & Zinkham, 2008; Trant & Wyman, 2006). However, little research has been found that focuses solely on exploring the use of Web 2.0 applications and principles in online digital collections.

Since Web 2.0 applications tend to promote an object-oriented culture (Engeström, 2005), where user interactions occur around digital objects such as images, videos and links online it can be speculated that digital collections are an ideal means of encouraging user interaction with CHIs and the content they offer. In recognition of such potential this research investigated the extent to which online digital collections use Web 2.0 applications and

principles. It also explored the nature of participation that occurs in online digital collections. This research has developed a snapshot of current practices in online digital collections in order to discover which ones work well. The findings from this research can help CHIs reassess the manner in which they are allowing users to engage with their digital collections.

## **2.2. Definitions**

- ❖ Cultural heritage institutions – In this research the term cultural heritage institution (CHIs) encompasses archives, libraries and museums.
- ❖ Digital collections – For the purposes of this research digital collection was defined as a collection of digitised objects such as documents, images, sounds, or videos.
- ❖ Digital objects – The term “digital object” and “content” has been used interchangeably in this research to refer to the items that a digital collection contains.

## **2.3. Research Objectives**

One aim of the research was to evaluate whether CHIs have evolved their modus operandi from an information transmission model to a more participatory approach. This research thus investigated the adoption of Web 2.0 principles and applications in their online digital collections. A comparative snapshot of CHI adoption across different types of CHIs and CHIs in differing locations was developed. The comparisons were done in order to discover whether archives, libraries and museums gravitated towards different Web 2.0 principles and whether the evolution of Australasian CHIs online could be considered on par with their North American counterparts.

The raison d'être for CHIs adopting Web 2.0 applications and principles is a desire to engage their users and interact with them. Another objective of this research was thus to recommend forms of online participation users gravitated towards and CHIs should make available. This research identified forms of participation that the CHIs currently offered and which ones among them were used most frequently across digital collections.

One of the most frequently offered forms of participation in Web 2.0 applications is commenting. This research investigated the nature of user comments on the objects in digital collections with the aim of providing an overview of the type of user responses that CHIs should expect in their digital collections, so they can plan accordingly.

## ***2.4. Research Questions***

### **2.4.1. Research Question One**

To what extent and in what manner have cultural heritage institutions (CHIs) adopted Web 2.0 principles and applications for their digital collections? Are there any differences in adoption between archives, libraries and museums? Are there any differences between Australasian CHIs and North American CHIs?

### **2.4.2. Research Question Two**

What forms of online participation do CHIs offer users in Web 2.0-enabled digital collections; which forms do users prefer?

### **2.4.3. Research Question Three**

In terms of commenting, what types of responses do objects in digital collections invoke from users?

### **3. Literature Review**

#### **3.1. *Web 2.0***

Despite arguments on the validity of such a term (Anderson, 2006; Scholz, 2008), Web 2.0 has been used to denote a perceived paradigm shift from a broadcast, or information transmission, model of the web to a more social model that allows easier communication and collaboration through its ‘architecture of participation’ (Madden & Fox, 2007). Blogging, tagging, social bookmarking and social networking are some of the activities that have flourished through Web 2.0 applications such as Wordpress, Flickr, Delicious and Twitter. They have enabled greater collaboration and improved interactivity between users online. The popularity of Web 2.0 applications has led to various industries attempting to embrace the social spirit of Web 2.0 and appropriating the suffix ‘2.0’ to label their efforts in this direction.

#### **3.2. *Web 2.0 for Cultural Heritage Institutions***

As Web 2.0 applications and principles have begun to be adopted by CHIs and discussed in library and information science, museology and archival literature they have come to embody certain connotations for these industries.

The phrase ‘Library 2.0’ was coined in 2005 by Casey in reference to the implementation of Web 2.0 tools in a library environment (Casey & Savastinuk, 2007). Much discussion has followed since the coining of the phrase on what Library 2.0 implies (Casy & Savastinuk, 2007). The concept of Library 2.0 has come to represent a meaning beyond technological innovation (Maness, 2006) to incorporate principles of interactivity (Holmberg, Huvila, Kronqvist-Berg, & Widén-Wulff, 2009), communal innovation (Maness, 2006) and “constant

and purposeful change” (Casy & Savastinuk, 2007, p.5), through a renewed focus on “participatory, user-driven services” (Casy & Savastinuk, 2007, p.5).

Though the terms ‘Museum 2.0’ and ‘Archive 2.0’ have not gained as widespread currency in academic literature as ‘Library 2.0’, references to them are also beginning to emerge. Nina Simon coined the notion of ‘Museum 2.0’ and has used the analogy of Web 2.0 to encourage museums to transform into ‘participatory museums’ (Simon, 2010). In museum literature the use of Web 2.0 has become characterised with principles of a culture of openness (Kelly, 2009), an appreciation for multivocality around collections (Srinivasan, Boast, Furner & Becvar, 2009), and an increasing interest in co-creativity between institutions and the public (Watkins & Russo, 2007).

The archives field is similarly starting to discuss the 2.0 philosophy as a shift towards a perspective that promotes sharing, collaboration, and openness (Palmer, 2009). This has led to a “democratisation” of those archives that are embracing the 2.0 evolution with the intent to empower users (Flinn, 2010), allow for greater intellectual accessibility (Krause & Yakel, 2007), and a move from positivism towards a more postmodern archival treatment (Krause & Yakel, 2007) through “decentralised curation, radical user orientation, and contextualisation of both records and the entire archival process” (Huvila, 2008, p. 16).

According to Rogers’ (2003) ‘diffusion of innovations’ theory no matter how advantageous a new idea is it often takes a considerable amount of time before the idea is widely adopted. In this case the rate of adoption of Web 2.0 applications and principles has perhaps yet to reach critical mass within the cultural heritage sector such that the continued adoption of them can be considered self-sustaining. Since Web 2.0 adoption is still in its infancy in the cultural

heritage sector the majority of literature on the topic has mostly been introductory, theoretical or exploratory in nature (Rutherford, 2008a).

### ***3.3. Benefits and Challenges of adopting Web 2.0***

Web 2.0 is being discussed by CHIs as the enabler of a more participatory model of service (Miller, 2005). Web 2.0 applications and principles can be used as a means of improving services by harnessing customer knowledge and feedback (Casey & Savastinuk, 2006). They can help make digital content more interactive and accessible (Maness, 2006). The low monetary cost of using Web 2.0 applications has been perceived as an advantage as institutions can experiment with relatively little risk (Rutherford, 2008b). Web 2.0 applications have also been seen as an effective promotional tool (Samouelian, 2009). The potential of Web 2.0 applications in allowing CHIs to reach out to non-users and engage their interests (Casey & Savastinuk, 2006) and their ability to push content beyond institution walls to places which users frequent (Curran, Murray & Christian, 2007) has been applauded.

Research has been conducted to test whether the assumption that Web 2.0 principles can engage users online and encourage the development of an active community is a valid one or not. Cocciolo (2010) compared the use of an academic institutional repository with Web 2.0 design patterns and a similar one without Web 2.0-enabled affordances in the same community over two continuous non-overlapping periods of time. He found that the Web 2.0-enabled system, which allowed users to instantly post files, edit records, comment and create tags, had a significantly positive impact on community participation over the non-Web 2.0-enabled version (Cocciolo, 2010). Similarly, Srinivasan, Boast, Becvar and Furner (2009) compared the use of a Web 2.0-enabled museum catalogue, which allowed comments and tagging, with a non-Web 2.0-enabled one, which didn't. Their findings, however, differed

from Cocciolo's, though they provided noteworthy reasons for the failure of their Web 2.0-enabled catalogue in engaging users successfully.

Srinivasan et al. (2009) found that the lack of comprehensible contextual information, in the form of descriptions and tags that non-specialists could understand, proved to be a barrier for any meaningful interaction with their catalogue records. Plain language descriptions, according to them, would have allowed users to contextualise what they were viewing and help provide foundation for the contribution of various perspectives on the object (Srinivasan et al., 2009). This is an important lesson for all involved in providing digital collections as it demonstrates that the mere adoption of Web 2.0 applications or principles cannot encourage engagement if it isn't also supported by an environment that is conducive to participation.

Other challenges in the adoption of Web 2.0 applications and principles by CHIs include: the likelihood of Web 2.0 applications being abandoned by the institution or its users (Kelly, 2009), grappling with management and staff acceptance (Rutherford, 2008b), conflict with the status of CHIs as controller and gatekeeper of information content (Rutherford, 2008a), issues relating to authentication and intellectual property (Joint, 2008), security risks such as malevolent web-bots (Joint, 2009) the possibility of unexpected failure of third-party Web 2.0 applications (Kelly 2009) and balancing customer participation with privacy (Casey & Savastinuk, 2006).

### **3.4. *CHIs that have adopted Web 2.0***

Numerous case studies have been published in LIS, museology and archival literature discussing the experience of CHIs in implementing particular Web 2.0 applications. One of the earliest examples of successful adoption of Web 2.0 principles by CHIs is *steve.museum* (<http://tagger.steve.museum/>), a multi-institutional collaboration of art museums that has implemented social tagging to improve accessibility to their collections through *folksonomy* (Trant & Wyman, 2006). The Polar Bear Expedition Digital Collections project (<http://polarbears.si.umich.edu/>) was an attempt by a digital archive to promote multivocality in its collection by allowing comments (Krause & Yakel, 2007). The Library of Congress' Flickr Pilot Project ([http://www.loc.gov/rr/print/flickr\\_pilot.html](http://www.loc.gov/rr/print/flickr_pilot.html)) aimed to build an online community and engage new users and did so by making some of their collection of historical photographs available on Flickr, a Web 2.0 application, and inviting users to describe them through comments or tags; the project was a resounding success (Springer, Dulabahn, Michel, Natanson, Reser, Woodard, & Zinkham, 2008).

Closer to home, in Australia, the National Library of Australia launched its Australian Newspapers (<http://newspapers.nla.gov.au/>) collection online where the public could interact with its collections through tagging, text correcting, and commenting (Holley, 2010). They found the tagging feature to be a crowd-pleaser and the text-correcting feature was also used extensively by interested users (Holley, 2010). Such examples of the adoption of Web 2.0 applications and principles are growing in number and thus the time is ripe to conduct an investigation into the extent to which this is happening in different types of CHIs around the world.

To date there appear to have been only a few peer-reviewed research studies conducted that provide an overview of the manner in and extent to which social media has been embraced by CHIs. While similar research has been conducted for academic libraries fairly regularly (Abbas & Kim, 2010; Cuong Linh, 2008; Harinarayana & Raju, 2009; Manorama & Sunil, 2010) only three studies were found that considered CHIs like public libraries, museums and archives (Chua & Goh, 2010; López, Margapoti, Maragliano, & Bove, 2010; Samouelian, 2009).

Samouelian (2009) investigated the extent to which Web 2.0 applications were implemented in archival repository websites of United States of America (USA). Using content analysis she evaluated 213 archival repositories and found 40% (85) were hosting a digital collection. Of those hosting digital collections 45% (38) used Web 2.0 applications. The most popular Web 2.0 application in use was social bookmarking, followed by blogs, and a few of the archives allowed commenting and ratings as well (Samouelian, 2009).

Unlike Samouelian, Chua and Goh's (2010) investigation covered more than one country, allowing them to compare the adoption on a more global scale. They investigated 120 English-language library websites (academic and public) across North America, Europe and Asia and found North American libraries had comparatively higher Web 2.0 adoption rates (Chua and Goh, 2010). Their aim was to find what Web 2.0 applications were prevalent in libraries. They found that blogs were the most popular and were being used to encourage interaction with users on subject-specific topics (Chua & Goh, 2010). This was followed by wikis which were being used as either subject guides or to answer FAQs and RSS feeds to convey news about resources, collection updates or blog posts.

Like Chua and Goh, López et al (2010) used content analysis of websites for their study; they studied 240 museum websites from France, England, Italy, Spain, and the USA. López et al's (2010) investigation revealed that use of collaborative and participative Web 2.0 applications in the museum sector were scant and museums appeared to be still prescribing to an information transmission model of online communication. England and USA had better Web 2.0 adoption statistics compared to their European counterparts (López et al., 2010), which corresponds with Chua and Goh's (2010) findings. RSS feeds were the most common Web 2.0 application available while forums, blogs, and tagging and commenting capabilities on collections were rare (López et al., 2010). Since they did not restrict their sample to English-based websites López et al. (2010) avoided the limitation of Chua and Goh's (2010) study.

### ***3.5. Participation through Web 2.0***

Participatory culture is characterised by low barriers to artistic expression and civic engagement, support for sharing an individuals' creations, a pervading feeling of social connection between members, belief by its members that their contributions matter and a sort of informal mentorship where novices are able to learn from experts (Jenkins, Clinton, Puroshotma, Robinson, & Weigel, 2005).

The proliferation of Web 2.0 applications has resulted in the prevalence of a participatory culture online where users have the ability to "creatively respond to a plethora of electronic signals and cultural commodities in ways that surprise their makers" (Willis, 2003, p.392) and where users often find "meanings and identities never meant to be there" (Willis, 2003, p.392). Such a culture supports individualised meaning-making and encourages interpretation through networked conversations (Fisher & Twiss-Garrity, 2007). This has led to

consumption shifting from its ordinary connotations of passivity to a more social practice (Green & Jenkins, 2009).

CHIs are starting to recognize the emergence of this online participatory culture by adopting Web 2.0 applications and principles for various purposes. Section 3.4 outlined some instances of Web 2.0-enabled digital collections. Web 2.0 applications have allowed users to become active agents in the meaning-making process (Deuze, 2006). This is because they allow users to archive, annotate, appropriate, and recirculate content (Jenkins et al., 2005), thus supporting remediation and bricolage (Deuze, 2006).

Porter and King (2007) observe that invitations to participate can be either passive or active. Passive invitations do not ask users to do anything directly but they are encouraged to participate through either the content or the tool. Examples of content-based invitations include writing compelling content and using a conversational tone (Porter & King, 2007). In the case of digital collections, strategically selecting content that is of interest to users and responding to users in an approachable manner may be considered a passive invitation. Tool-based invitations include allowing comments, responding to them promptly to facilitate a conversation and making available RSS feeds (Porter & King, 2007), all of which is highly relevant for digital collections. On the other hand active invitations are those that ask the users to do something such as responding to a question or contributing towards a project (Porter & King, 2007). Asking users to produce a curated gallery of Flickr images from an institution's digital collection is an example of the latter. CHIs should ensure they are using both to cater for their diverse user base.

### **3.6. *Gap in Literature***

As illustrated in the literature review, the benefits and challenges of the adoption of Web 2.0 applications and principles has been given due consideration in library, museology and archival literature. However, no comparative study was found on how archives, museums and libraries are faring in the adoption of Web 2.0 applications and principles for their digital collections in particular. No information was found on whether Australasian CHIs were on par with their North American counterparts either. There also appears to be a dearth of literature in the cultural heritage sector examining the nature of user participation in Web 2.0-enabled digital collections and how it may be encouraged further. This research aimed to bridge the aforementioned gaps in literature.

## **4. Theoretical Framework**

According to Merriam (2009) the theoretical framework of a research is its scaffolding. Maxwell (2005) calls it the ‘conceptual framework’ or ‘idea context’ of a study and notes that it can encompass ideas, beliefs, concepts, theories and models, regardless of whether they have been formally published or not. This research was influenced by the principles of Web 2.0 outlined by Cocciolo (2010), the Social Technographics Profile (Li & Bernoff, 2008) – which is a model of online participation, and the act of cultural heritage consumption.

### **4.1. *Principles of Web 2.0***

The developers at Teachers College, Columbia University used the following principles to guide the design of a Web 2.0-enabled institutional repository:

- ❖ Non-authoritative information organisation

- ❖ Trust in the community
- ❖ High degree of control for users
- ❖ System improves in usefulness as it is used by more people
- ❖ A fun and playful attitude

(Cocciolo, 2010)

These principles succinctly summarise the ‘architecture of participation’ (Madden & Fox, 2007) that most Web 2.0 applications are built upon and that manifest themselves as features like tagging and commenting.

This research used the principles outlined above to structure its investigation into the presence of Web 2.0-enabled digital collections. It was necessary to forge Web 2.0 into a theoretical lens for this research rather than just counting which digital collections are hosted on Web 2.0 applications because some collections may be hosted on the CHI’s website and a means was needed to identify whether those collections could be considered Web 2.0-enabled.

Additionally, even digital collections hosted on Web 2.0 applications may have varying degrees of ‘Web 2.0-ness’ as some CHIs may disable certain features. Counting how many principles a digital collection adhered to was considered a more representative means of judging Web 2.0 adoption.

## ***4.2. The Social Technographics Profile***

Participation can be seen as an interactivity continuum. Activities can range from labour intensive, which Nielsen’s (2006) 90:9:1 principle predicts only a select few will indulge in, to more casual modes of participation which a large part of the population may be involved with (Green & Jenkins, 2009). According to the Social Technographics Profile model,

developed by Forrester's Research, online users can be divided into overlapping groups according to the nature of their participation (Li & Bernoff, 2008). The Social Technographics Profile consists of a participative ladder, as illustrated in Figure 1.

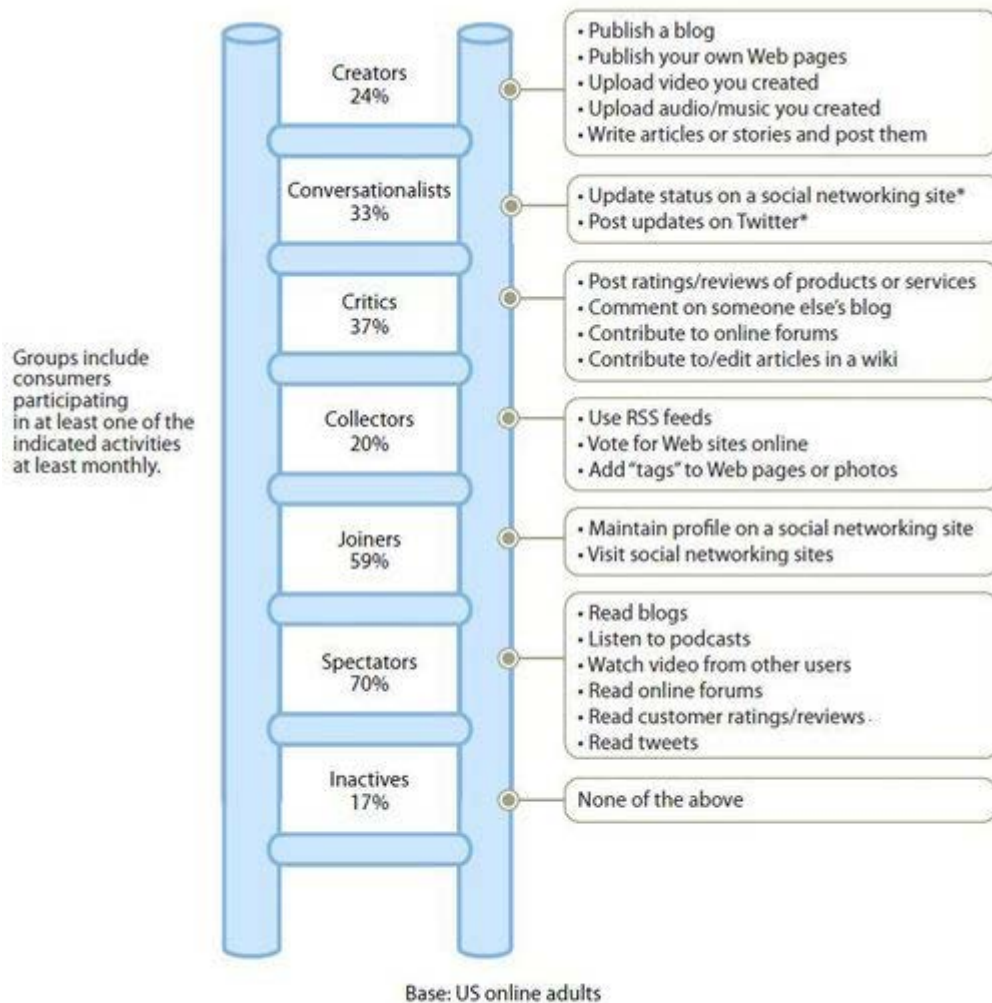
The model groups people based on their activities as follows:

- ❖ Creators: Users who indulge in some form of creative exercise on a social media platform at least once a month, such as blogging, podcasting or developing user-generated content
- ❖ Conversationalists: Users who are present in social networking sites such as Twitter or Facebook and tweet or update their status at least weekly
- ❖ Critics: Users who react to content and each other by commenting, writing reviews and rating
- ❖ Collectors: Users who organize or classify content through tagging and social bookmarking services like del.icio.us and users who accelerate content consumption using RSS feeds and widgets
- ❖ Joiners: Users who like to connect by maintaining profiles on social networking sites
- ❖ Spectators: Users who consume what has been produced
- ❖ Inactives: Those that remain untouched by social media

(Bernoff, 2010; Li & Bernoff, 2008).

The model was adapted for this research by renaming the above categories such that they identified types of participatory activities online. The adapted model is outlined in Section 5.4.1.2. The adapted model is valid because most of the types of users identified in the original model are a result of the forms of participation they can engage in.

**Figure 1: Social Technographics Profile (Bernoff, 2010).**



Source: North American Technographics\* Empowerment Online Survey, Q4 2009 (US)  
 \*Conversationalists participate in at least one of the indicated activities at least weekly.

56291

Source: Forrester Research, Inc.

**Note: the numbers mentioned in the figure are not relevant for this research.**

### **4.3. Cultural Heritage Consumption**

Rejecting the notion of visitors as passive and uncritical consumers of heritage, Bagnall (2003) asserts that in fact heritage consumption is a complex and diverse process and evokes reminiscences that are informed by performativity. Talking about heritage sites he argues that visitors there engage with their surroundings in an emotional and imaginative manner, not just

cognitively (Bagnall, 2003). The emotional response may lie anywhere on the continuum of confirmatory and rejective or even a negotiated reading where the visitor may accept the message of a site but modify their reading of it partially (Bagnall, 2003). Research done by Bagnall (2003) has demonstrated that visitors rely on personal or family memories and memories that are part of their cultural biographies and narratives during heritage consumption.

Similarly, Selby(2010) notes that not only are visitors involved in the consumption of signs and symbols of cultural heritage tourism they also become involved in acts of representation through the semiotic triangle of signifier, signified and interpretant (Echnter, 1999, as cited in Selby, 2010, p. 41). For example, the signifier may be an old tractor at a museum, while the signified could be ‘agricultural history’ but the consumer’s (the interpretant) interpretation can add another layer of meaning to the signifier. The process of cultural heritage consumption, thus, involves visitors drawing upon their ‘stock of knowledge’ (Schutz, 1972, as cited in Selby, 2010, p. 47), which can be first-hand or mediated, so that their intersubjective understanding helps them interpret their experience, find meaning and engage emotionally (Selby, 2010). Bagnall (2003) also argues that multivocality around sites, where a variety of discourses are present, be they complementary or contradictory, can influence the performativity of visitors, who may feel compelled to reflect on the complex narratives presented to them and give meaning to their experience of them.

While Selby (2010) and Bagnall (2003) are discussing heritage consumption in the context of physical heritage sites their observations may be considered equally applicable to the consumption of digital cultural heritage. This research used cultural heritage consumption as a lens with which to interpret the responses of users to digital collections and their content.

## **5. Research Design**

### ***5.1. Research Paradigm***

Creswell (2009) refers to paradigm as a researcher's philosophical worldview, which influences the character of their research. Bryman (2008) elaborates that what will be studied, how it will be studied and how the results of the study will be construed and unraveled are guided by a set of beliefs which can be called a paradigm. This research followed a pragmatic paradigm.

Pragmatists reject the positivist's correspondence theory of truth, which sees ideas as being true or false, for an instrumental truth, which sees ideas as being a means to achieve an aim and the truth of those ideas depends on whether it affects practice or not (Sundin & Johannisson, 2005). Thus, the pragmatic paradigm is ontologically geared and perceives truth to be situational, mutable and a functional means of comprehending reality, unlike positivists who believe in an objective reality and interpretivists who endorse a subjective one (McCaslin, 2008).

The aim of this research was to develop an understanding of how Web 2.0 has been adopted in digital collections and deliver findings that are entrenched in practical considerations. Pragmatism was considered the appropriate paradigm for this research because a pragmatic worldview is problem-centred, oriented towards real-world practice and subscribes to a pluralistic approach towards researching a problem (Creswell, 2009).

## **5.2. Research Methodology**

In keeping with the pragmatism paradigm, this research used a mixed methods methodology, which means both quantitative and qualitative methods were used. In some academic circles mixed methods research is thought infeasible because the epistemological stances of qualitative and quantitative methods are considered irreconcilable (Bryman, 2008). However, the pragmatic paradigm holds that a fixation on “how we know what we know” (McCaslin, 2008, para. 6) is unnecessary and usability of results is not judged by the ability to render an objective or subjective truth but by how they help reveal the nature of reality (McCaslin, 2008). A mixed methods approach to research was used because this research required diverse types of data in order to gain a better understanding of the research problem (Creswell, 2009).

Quantitative and qualitative methods were employed to answer different research questions. Quantitative methods were used for Research Question One and Research Question Two to generate a snapshot of Web 2.0 adoption and associated participatory activities in online digital collections. A qualitative approach was used for Research Question Three in order to explore the nature of user responses to objects in digital collections.

## **5.3. Research Sample**

### **5.3.1. Sample for Research Question One and Two**

Two cross-parameters were used when selecting CHIs: CHI type and physical location. The types of CHIs to be investigated were limited to archives, libraries and museums. They were considered most likely to have digital collections and use Web 2.0 applications compared to smaller scale institutions such as historical associations because most of the literature found during the literature review was based on their experiences.

One aim of the research was to assess whether differences existed between Australasian CHIs (referring, for the purposes of this research, to Australia and New Zealand) and their North American counterparts. North American CHIs were selected as a frame of reference to evaluate Australasian CHIs against because most of the literature found during the literature review was based on North American institutions, in particular USA and Canada.

López et al (2010) used a socio-demographic criterion when selecting museums for their study on Web 2.0 applications in museum web sites. This research used the same sampling technique. For each country, first the national CHI of each type was selected. Then CHIs of the first most populated city were selected, based on the most recent population census, followed by those of the second most populated city, and so on.

Using the criteria outlined above six CHIs with digital collections were selected from each country, totaling 24 CHIs of each type. A total of 72 CHIs were thus sampled for investigation. The search engine Google was used to find CHI websites. The web site selected was scanned for the presence of online digital collections. If a CHI website did not have digital collections then the CHI website for the selected city's state/ province /region was investigated. If that did not have digital collections either then the next most populated city was investigated for that CHI type. If a CHI website was not available in English the CHI website for the selected city's state/ province /region was investigated. If that wasn't in English either the next most populated city was investigated for that CHI type. If a CHI website was in English and had digital collections then a number was assigned to each digital collection and simple random sampling was used to select one from among them. The

resulting sample of digital collections was used to collect data for Research Question One and Two.

### **5.3.2. Sample for Research Question Three**

In order to explore the nature of user responses through comments a list of digital objects with comments was required. A list of Web 2.0-enabled digital collections that allowed user comments and where at least one object in the collection had received at least one comment was extracted from the data that was generated during the content analysis conducted for Research Question Two. For each collection in that list, a list of all digital objects in the collection that contained at least one user comment was created by visiting each digital object in the collection. The list created noted the URL of the digital object and the number of user comments it received. 319 digital objects across 19 digital collections were found that had a total of 1116 comments.

However, only a sample of these comments was analysed due to the short time frame available for the research. From the aforementioned list up to three digital objects from each collection were selected. The selection of objects was based on which had received the highest number of comments in the collection, to maximise the number of comments in the final sample. If a collection only had three or less objects which received comments at all then all the objects with comments were added to the sample. Where objects in a collection had the same number of comments a simple random sample was used to decide which to add to the sample. The resulting sample contained 46 digital objects across 19 digital collections with a total of 315 comments. This sample of user comments was used for Research Question Three.

### **5.3.3. Sample for pilot test**

In order to develop and refine the coding schemes to be used during the content analysis of Research Question One and Two a pilot test was conducted. Three Web 2.0-enabled digital collections from CHIs located in United Kingdom were selected – one from each CHI type. United Kingdom was selected as the location so there would be no overlap with the digital collections in the research sample. Web 2.0-enabled digital collections were selected so the coding scheme for all research questions could be tested on them. The collections were found using Google. The pilot test was conducted in a staged manner. Before data collection and analysis was conducted on the actual sample the coding scheme was tested on the pilot sample and modified for suitability based on the results from the pilot test.

## **5.4. *Data Collection and Analysis***

Content analysis is a research method that is usually used to examine documents and texts (Bryman, 2008). The coding process forms the foundation of content analysis. Coding schemes are used to guide the analysis of content by outlining variables or categories of interest and rules on how to interpret those during collection and analysis of data (Hsieh & Shannon, 2005). Using the coding scheme the researcher identifies patterns or themes that exist in the content (Hsieh & Shannon, 2005). In the case of quantitative content analysis the coding scheme is often pre-determined while qualitative content analysis usually follows a more emergent path. This research, like Chu and Goh (2010) and Samouelian (2009), used content analysis to examine CHI websites and digital collections.

Conducting interviews or self-completion questionnaires with CHIs that have online digital collections and users of those collections could have been a means of collecting data instead of using content analysis. However, given that the scope of the research included CHIs from

different countries, interviews would have been impractical. Self-completion questionnaires would have suffered from self-selection bias where only those institutions and users interested in Web 2.0 may have responded. It was also thought that the response rate from users would not be very high as they may no longer be interested in talking about their participation in a digital collection or their contact details may not be up to date which meant they would not receive the questionnaire. Content analysis was preferred for its unobtrusive nature. The time frame of the research posed a limitation so content analysis of readily available material was considered the better option.

CHI websites and their online digital collections were analysed using a three step content analysis process.

### **5.4.1. Quantitative content analysis**

Quantitative content analysis was used for Research Question One and Research Question Two as these questions sought to develop a snapshot of Web 2.0 adoption in digital collections, and the resulting participation, in a transparent and replicable manner. The objective and systematic quantification of occurrences of specified characteristics (Bryman, 2008) makes it possible for longitudinal analysis to be conducted on the subject. This was considered a useful advantage as changes in the intersection of Web 2.0 and digital collections can be tracked over time.

#### **5.4.1.1. Research Question One**

First a directed quantitative content analysis of CHIs websites and their digital collections was conducted to ascertain whether CHIs used a Web 2.0-enabled approach for their online digital

collections. In a directed approach the coding scheme is based on an existing theoretical framework (Hsieh & Shannon, 2005). Research Question One used the coding schedule depicted in Table 1, which was based on the principles of Web 2.0 identified by Cocciolo (2010). The principles are outlined in Section 4.1.

**Table 1: Coding schedule for Research Question One**

|   |           |   |                              |   |       |
|---|-----------|---|------------------------------|---|-------|
| ID  | Continent | CHI Type  | Digital collection hosted on | Institution uses at least one third-party Web 2.0 application | Notes |
| Web 2.0 Principle: Trust in the community           | Notes     | Web 2.0 Principle: Non-authoritative information organisation                 | Notes                        |   |       |
| Web 2.0 Principle: High degree of control for users | Notes     | Web 2.0 Principle: System improves in usefulness as it is used by more people | Notes                        | Web 2.0 count   |       |

Guidelines on how to interpret the Web 2.0 principles identified by Cocciolo (2010) were developed for the coding manual to ensure they were relevant to the context of digital collections. This was done based on the observations made during the pilot test. Research Question One used the coding manual outlined in Table 2.

**Table 2: Coding manual for Research Question One**

| Variables & their categories | Guidelines                             |
|------------------------------|--|
| ID                           | ID assigned to the CHI during sampling |

|   |  |
|---|--|
| Continent   |  |
| North America   | If the CHI is located in Unites States of America or Canada  |
| Oceania   | If the CHI is located in Australia or New Zealand  |
| CHI Type  |  |
| Archive   | If the CHI has the word “archive” in its name or on its website  |
| Library   | If the CHI has the word “library” in its name or on its website  |
| Museum  | If the CHI has the word “museum” in its name or on its website   |
| Digital collection hosted on                                  |  |
| Collaborative cultural heritage website                       | If the digital collection is hosted on a website which hosts digital collections from numerous other CHIs in the country   |
| Institution-run website                                       | If the digital collection is hosted on a website run by the CHI  |
| Third-party Web 2.0 website                                   | If the digital collection is hosted on a social networking website, a photo or video sharing website or any other Web 2.0 application  |
| Institution uses at least one third-party Web 2.0 application |  |
| Yes   | If the CHI has an account on a social networking website, a photo or video sharing website, a blogging website or any other Web 2.0 application and they use it for purposes other than hosting their digital collection           |
| No  | If a CHI uses no Web 2.0 application   |
| Notes   | Document which Web 2.0 applications are used by CHI  |
| Web 2.0 Principle: Trust in the community                     |  |
| Yes   | If the digital collection supports: <ul style="list-style-type: none"> <li>▪ multivocality, for e.g. through comments on the digital objects</li> <li>▪ user evaluation, for e.g. through rating of the digital objects</li> </ul> |
| No  | Default value  |
| Notes   | Document details about how digital collection follows principle if required  |
| Web 2.0 Principle: Non-authoritative information organisation |  |
| Yes   | If the digital collection allows users to:   |

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>publicly label digital objects, for e.g. through social tagging</li> <li>publicly collate digital objects, for e.g. through the creation of a digital gallery</li> </ul>  |
| No  | Default value  |
| Notes   | Document details about how digital collection follows principle if required  |
| Web 2.0 Principle: High degree of control for users                           |  |
| Yes   | <p>If the digital collection allows users to:</p> <ul style="list-style-type: none"> <li>control their own data, for e.g. users can post, delete or edit their comments at any time</li> <li>share or remix the digital objects, for e.g. through a Creative Commons license</li> <li>modify it, for e.g. by adding more digital objects or editing existing ones</li> </ul> |
| No  | Default value  |
| Notes   | Document details about how digital collection follows principle if required  |
| Web 2.0 Principle: System improves in usefulness as it is used by more people |  |
| Yes   | If the digital collection displays visual cues to indicate the size and composition of user activity, for e.g. by showing the number of times a digital object has been viewed   |
| No  | Default value  |
| Notes   | Document details about how digital collection follows principle if required  |
| Web 2.0 Count   | The number of times Yes was recorded against a Web 2.0 principle for the digital collection  |

Though the guidelines in the coding manual were sufficient in collecting and analysing data for this research it should be noted that they are by no means comprehensive. As more Web 2.0 design patterns emerge the guidelines will have to be expanded; these were based on what was observed in the pilot test.

During the pilot test it became apparent that the meaning of the Web 2.0 principle “a fun and playful attitude” was highly subjective and it would be hard to develop concrete guidelines for when a digital collection can be labeled as being fun and playful. It was also thought that while the other Web 2.0 principles can be considered stand-alone, such that if even one is met a collection can be considered Web 2.0-enabled, it is possible for a digital collection to be presented in a fun and playful manner and still not have any Web 2.0 feature present. This could lead to a miscount in the number of digital collections that are Web 2.0-enabled. A decision was made to drop the counting of this characteristic so it was omitted from the coding scheme.

Most of the data collected from the coding scheme was in the form of dichotomous variables. This is because only two categories were available for the variables relating to Web 2.0 principles – Yes or No. Some data was in the form of nominal variables, for example “Institution Type” had three possible categories. The findings have been summarised using tables and graphs in Section 6.1.

#### **5.4.1.2. Research Question Two**

Where a digital collection was coded as having a Web 2.0 count equal to or greater than one, a second step of directed quantitative content analysis was conducted to determine the forms of online participation that the CHIs offered users through their digital collection and which

forms were popular among users. Research Question Two used the coding schedule depicted in Table 3, which was based on the Social Technographics Profile (Li & Bernoff, 2008) outlined in Section 4.2.

**Table 3: Coding schedule for Research Question Two**

|    |      |                           |          |                           |
|----|------|---------------------------|----------|---------------------------|
| ID | Join | Participation<br>Occurred | Converse | Participation<br>Occurred |
|----|------|---------------------------|----------|---------------------------|

|           |                           |            |                           |             |                           |
|-----------|---------------------------|------------|---------------------------|-------------|---------------------------|
| Collect I | Participation<br>Occurred | Collect II | Participation<br>Occurred | Collect III | Participation<br>Occurred |
|-----------|---------------------------|------------|---------------------------|-------------|---------------------------|

|            |                           |             |                           |              |                           |
|------------|---------------------------|-------------|---------------------------|--------------|---------------------------|
| Critique I | Participation<br>Occurred | Critique II | Participation<br>Occurred | Critique III | Participation<br>Occurred |
|------------|---------------------------|-------------|---------------------------|--------------|---------------------------|

|        |                           |       |
|--------|---------------------------|-------|
| Create | Participation<br>Occurred | Notes |
|--------|---------------------------|-------|

As noted in Section 4.2, the categories identified in the Social Technographics Profile were renamed from categories of types of users to types of participatory activities online. Collect and Critique have three columns in the coding scheme because when the pilot test was conducted it was found that some digital collections offer more than one means of collecting and critiquing information. The maximum number identified was three. However a Notes column was made available in case there were not enough columns available to record a participatory activity. After the pilot test, “Spectators” and “Inactives” from the Social Technographics Profile were dropped from the coding scheme. It was considered that neither was relevant for the research question. All digital collections found for the research were

viewable so recording viewing as a participatory activity was not required. “Inactives” refers to those users that digital collections do not touch and did not have any equivalent participatory activity.

Operational definitions relevant to the context of digital collections were developed for each category of online participatory activity. They were refined based on the experience from the pilot test. The coding manual has been outlined in Table 4.

**Table 4: Coding manual for Research Question Two**

| Category               | Operational Definition   |
|------------------------|--|
| ID                     | ID assigned to the CHI during sampling   |
| Join                   | Record all online participatory activities that allow users display their interest in a collection through an online public profile  |
| Converse               | Record all online participatory activities that support conversation about the content in digital collections in other social networking sites that users frequent   |
| Collect I, II, III     | Record all online participatory activities that support the organisation and classification of content in digital collections  |
| Critique I, II, III    | Record all online participatory activities that allow users to react to the content in digital collections in the online space they are available from   |
| Create                 | Record all online participatory activities that support the contribution of user-generated content in response to the content in the digital collections   |
| Participation Occurred | Choose from: <ul style="list-style-type: none"> <li>▪ Unable to verify the occurrence or non-occurrence of participation</li> <li>▪ No participation has occurred yet</li> <li>▪ Participation has occurred</li> </ul> |
| Notes                  | Record any forms of participation (along with type of participation) that may not have fit in the table because it was full  |

### 5.4.2. Qualitative content analysis

Qualitative content analysis was used for Research Question Three. The question was exploratory in nature and aimed to search for underlying themes in the material selected (Bryman, 2008). In qualitative content analysis themes are constantly revised and the process of conceptualisation, data collection, analysis and interpretation is recursive and reflexive (Altheide, 1996, as cited in Bryman, 2008, p. 531). Qualitative content analysis is considered useful because the findings are based on actual data instead of preconceived theoretical perspectives (Hsieh & Shannon, 2005). This method was suitable for Research Question Three as the focus was on discovering the nature of user comments, not validating an existing model.

#### 5.4.2.1. Research Question Three

The third step involved a conventional qualitative content analysis of one particular form of participation – commenting, to determine the nature of user responses to objects in digital collections. Existing theory or research on the nature of user reactions on online digital collections is limited so the categories were allowed to emerge from the data. Compared to the deductive category application for Research Question One and Two, Research Question Three had to follow a more inductive approach to category development (Hsieh & Shannon, 2005). The coding schedule depicted in Table 5 was used to aid in the content analysis.

**Table 5: Coding schedule for Research Question Three**

| Digital Object Id | Comment | Comment Category | Comment Subcategory |
|-------------------|---------|------------------|---------------------|
|-------------------|---------|------------------|---------------------|

The comments identified in the sample were added to the coding schedule so that all the user responses could be read repeatedly. Similar comments were then highlighted in the same colour to develop a picture of the themes present. Category names emerged through this clustering exercise and definitions for the categories were then developed.

## **5.5. *Limitations***

This research suffered from the following limitations:

- The lack of a comprehensive list of digital collections per country or CHI type meant that gathering a sample of digital collections across different types of CHIs and across different locations was time consuming. Because of the time consuming nature of the sample development only 12 digital collections per location and type were found – that is 12 North American archives, 12 North American libraries and so on. The small number of sample for each category means that the credibility of the comparisons outlined in the research are questionable as it may be that the sample collected was not representative enough.
- This research used content analysis which is reliant on the process of coding content. Coding content requires a degree of interpretation on the coder's part and it is not unlikely that the researcher's personal bias may have had an impact on the way in which the data was coded.
- Both qualitative and quantitative research methods have disadvantages. This research found that the quantitative content analysis conducted on CHI websites and digital collections produced findings that require qualitative research in order to explore the reason behind the findings. It also found that the model developed from the qualitative research conducted requires quantitative validation to prove its credibility.

## **5.6. *Ethical Considerations***

All information gathered for this research was taken from the public domain. All websites, and digital collections analysed were freely accessible as was all information relating to user activity on those collections. The intention of this research was not to compare individual CHIs, digital collections, digital objects or user responses so it was not necessary to provide identifying data for any of them in the report. Since no personal information was gathered during the research and no identifying information was used in the report it was not necessary to obtain consent from anyone (Bryman, 2008).

## **6. Research Findings and Discussion**

The results of the research have been organised into three sections. Each section is based on the findings for one of the research questions outlined in Section 2.4. Tables and graphs have been used to visually summarise the findings for Research Question One and Two while Research Question Three relies on examples to discuss the findings.

### **6.1. *The state of Web 2.0 adoption***

In order to evaluate whether CHIs have evolved their modus operandi from an information transmission model to a more participatory approach 72 digital collection were analysed. The manner in and extent to which these collections had embraced Web 2.0 was investigated by comparing the adoption of Web 2.0 applications and principles across CHI types and CHI locations.

### **6.1.1. CHIs that use third-party Web 2.0 applications to host their digital collections**

One means of gauging whether CHIs have started embracing a Web 2.0 approach for their digital collections was to check whether the collections were hosted on Web 2.0 applications. Table 6 and Figure 2 summarise which types of locations the CHIs used to host their digital collections. From the sample of CHIs investigated in this research project it was found that the majority of CHIs (68%) preferred to host their digital collections on websites they controlled. The second most popular (25%) means of hosting digital collections was through third-party Web 2.0 applications. A small number of CHIs (7%) used collaborative cultural websites to host their digital collections. According to these findings only a small number of CHIs have adopted a Web 2.0 approach for their digital collections.

**Table 6: Types of locations used to host digital collections**

| Location used to host digital collection | Number of digital collection |
|--|------------------------------|
| Institution-run website                  | 49                           |
| Third-party Web 2.0 application          | 18                           |
| Collaborative cultural heritage website  | 5                            |
| Total                                    | 72                           |

**Figure 2: Types of locations used to host digital collections**

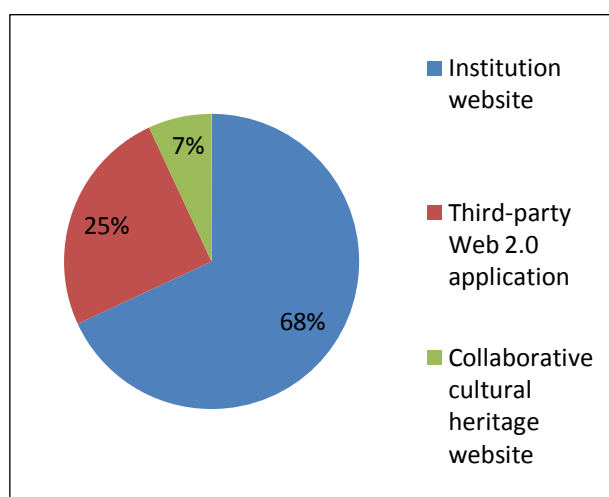
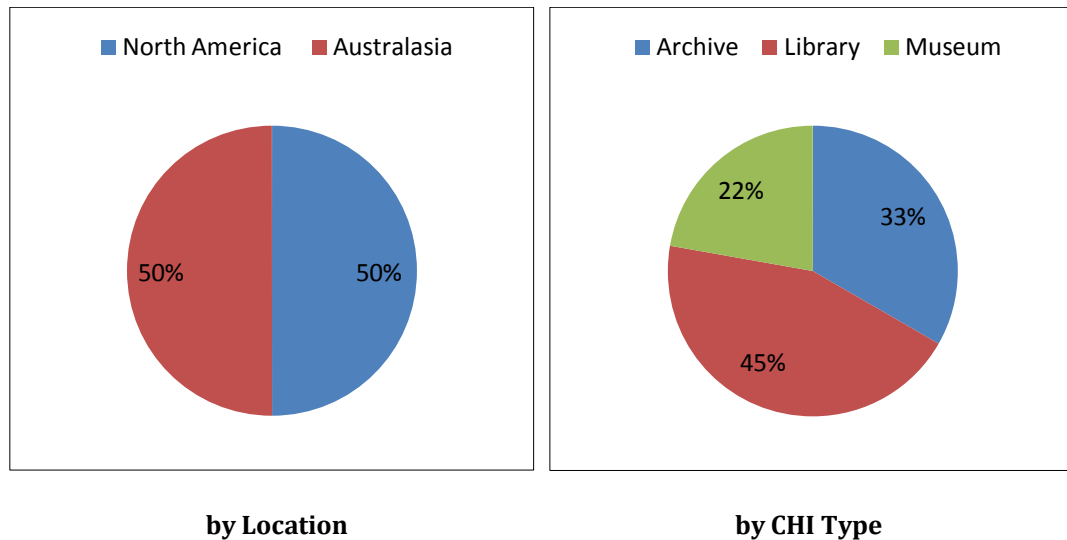


Table 7 and Figure 4 summarise how the use of third-party Web 2.0 applications differed across types of CHIs and their location. Of the 18 CHIs that used a third-party Web 2.0 application to host their digital collection, 50% were located in North America and 50% in Australasia. Though there was no difference in Web 2.0 adoption for digital collections in terms of CHI location, adoption numbers did differ between CHI types. Out of the 18 CHIs that used a third-party Web 2.0 application for their digital collection, 45% were libraries, 33% were archives and 22% were museums. According to these findings archives have been the slowest in providing Web 2.0-enabled digital collections.

**Table 7: Number of CHIs that use third-party Web 2.0 applications to host their digital collection**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 3       | 4       | 2      | 9                 |
| Australasia       | 3       | 4       | 2      | 9                 |
| Total by CHI type | 6       | 8       | 4      | 18                |

**Figure 3: Percentage of CHIs that use third-party Web 2.0 applications to host digital collections**



The findings confirm existing observations about the use of Web 2.0 in the archival community. According to Yakel (2006) archives have been slow to adopt an interactive approach online. She considers a desire to maintain authoritative metadata about collections as well as a desire to uphold the authority of the archivist as potential reasons for this (Yakel, 2006). Samouelian (2009) has commented on the comparatively smaller body of literature discussing the potential uses of Web 2.0 in the archival community compared to the library community.

17 of the 18 digital collections that were hosted on third-party Web 2.0 applications used Flickr while one used Youtube. Flickr is an online photo management and sharing application, though it also allows users to share videos. Youtube is an online video management and sharing application. The dominance of Flickr is probably unsurprising given the existence of The Commons. The Commons is “a designated area of Flickr where cultural heritage institutions can share photographs that have no known copyright restrictions to

increase awareness of their collections” (Springer et al., 2008, p. iii). This research did not explore how many of the 17 CHIs that had collections on Flickr were part of The Commons.

### **6.1.2. CHIs that use at least one third-party Web 2.0 application for purposes other than hosting their digital collections**

In order to compare CHIs’ adoption of Web 2.0 for digital collections with their willingness to embrace Web 2.0 in general, this research investigated how many CHIs in the sample used at least one third-party Web 2.0 application for purposes other than hosting their digital collections. 48 out of 72 (67%) CHIs from the sample were found using at least one third-party Web 2.0 application. The third-party Web 2.0 applications being used included Blogger, Delicious, Facebook, Flickr, Foursquare, Ning, Tumblr, Twitter, Vimeo, Wordpress and Youtube. Blogger, Tumblr and Wordpress are blogging platforms, Facebook, Foursquare, Ning and Twitter are social networks, Delicious is a social bookmarking service, Flickr is a photo sharing website and Youtube and Vimeo are video sharing websites. While the true intention behind using these applications can only be known by asking the CHIs directly it is not unreasonable to state that CHIs appear to be seeking new means of information acquisition, dissemination, organisation and sharing (Chua & Goh, 2010) in order to better engage with their online users.

Comparing these findings with those from Section 6.1.1 indicates that a majority of the CHIs appear to have embraced Web 2.0 applications but only 25% were willing to use them for their digital collections. While investigating the reason why CHIs would choose to adopt Web 2.0 applications but not use them for their digital collections was out of the scope of this research project, it may be a subject worthy of some investigation through interviews or

surveys. Such an investigation may wish to explore whether the reluctance stems from the unsuitability of Web 2.0 applications to host digital collections, due to issues such as rights management, or whether CHIs feel uncomfortable in ‘letting go’ of their content on a third-party medium with a culture that encourages multivocality and appropriation, which would challenge their traditional role as an authority.

**Table 8: Number of CHIs that use at least one third-party Web 2.0 application for purposes other than hosting their digital collections**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 6       | 8       | 9      | 23                |
| Australasia       | 7       | 10      | 8      | 25                |
| Total by CHI type | 13      | 18      | 17     | 48                |

**Figure 4: Percentage of CHIs that use at least one third-party Web 2.0 application for purposes other than hosting their digital collections**

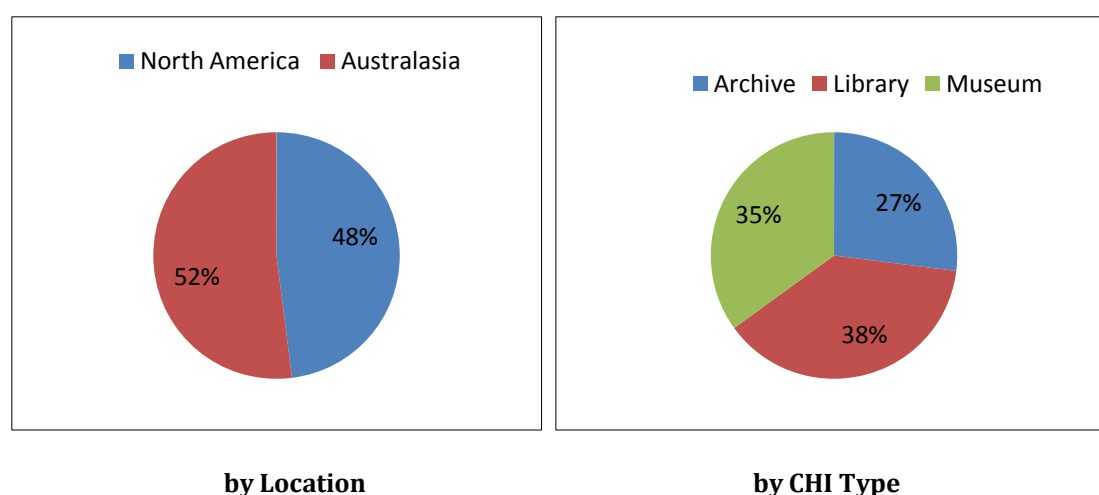


Table 8 and Figure 4 summarise the use of third-party Web 2.0 applications according to CHI type and location. Of the 48 CHIs that used at least one third-party Web 2.0 application for purposes other than hosting their digital collection, 48% were located in North America while 52% were located in Australasia. These findings are similar to those in Section 6.1.1.; there doesn't appear to be a huge disparity in the use of third-party Web 2.0 applications between North American and Australasian CHIs. Out of the 48 CHIs that used third-party Web 2.0 applications, 38% were libraries, 35% were museums and 27% were archives. These findings are also similar to Section 6.1.1; archives continue to lag in the adoption of Web 2.0 applications.

### **6.1.3. Web 2.0 principles**

Checking how many digital collections are hosted on third-party Web 2.0 applications is the most obvious method for gauging how Web 2.0 has been adopted in digital collections. However, it does not take into account all those digital collections that may be hosted in other locations, such as an institution's website, but may still be considered Web 2.0-enabled because the websites they are hosted on have features commonly used in Web 2.0 applications. It should also be noted that it is possible for CHIs to use third-party Web 2.0 applications for their digital collections but limit the extent to which users can interact with them by switching off the functionality they do not think is appropriate.

A more meaningful snapshot of the how Web 2.0 has been adopted for digital collections would be to compare how many digital collections offer certain types of Web 2.0 functionality. For this research, the Web 2.0 principles outlined in Section 4.1 were used to gauge the manner and extent to which CHIs have adopted a Web 2.0 approach for their digital collections. The following sections are divided into those Web 2.0 principles.

#### **6.1.3.1. Trust in the community**

For digital collections, “trust in the community” was defined as support for:

- multivocality, for e.g. through comments on the digital objects
- user evaluation, for e.g. through rating of the digital objects

Web 2.0 is often credited as being a paradigm shift from a passive one-way information transmission model to a more participatory approach of information sharing. Such a model depends on institutions trusting their community of users and encouraging their participation. If users feel that what they contribute matters and will be valued they are probably more likely to engage with the content that CHIs offer. For digital collections trusting the community is about privileging the user’s response to the content as much as the content itself. It is a transition from previous ‘reconstructionist’ and ‘verifiable’ attitudes to a more postmodern and interpretive approach towards cultural heritage (Cameron & Robinson, 2007; Huvila, 2008).

26 out of 72 (36%) CHIs in the sample entrusted the interpretation and evaluation of their digital collection’s content to their users. Table 10 and Figure 6 summarise the use of this principle in digital collections across types of CHIs and their location. 62% of the digital collections that supported this principle belonged to Australasian CHIs while 38% belonged to North American ones. This difference appears to be huge, but currently inexplicable.

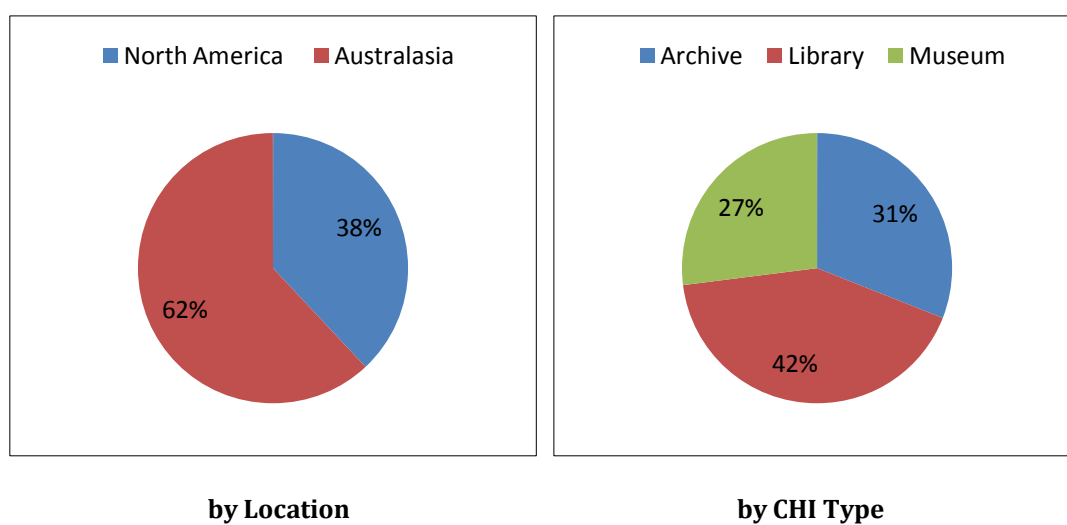
Of the 26 collections that supported this principle, 42% belonged to libraries, 27% to museums and 31% to archives. Libraries appear to be leading the support for this principle in their digital collections. The differences among the different CHI types on the support of this principle may stem from their diverse value-systems and the traditional intellectual differences among the institutions. While museums have usually focused on the protection

and preservation of their collections, archives tend to place value in evidentiary and contextual authenticity (Trant, 2009). In contrast, the primary concern of libraries has always been access and public literacy (Trant, 2009), which is comparatively more complementary to the emergence of community-based relevancy and user narratives. In the archival and museological tradition these may be seen as distractions from the actual content. Qualitative research in the form of interviews or surveys would be required to confirm this.

**Table 9: Number of digital collections that display trust in the community**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 4       | 4       | 2      | 10                |
| Australasia       | 4       | 7       | 5      | 16                |
| Total by CHI type | 8       | 11      | 7      | 26                |

**Figure 5: Percentage of digital collections that display trust in the community**



#### **6.1.3.2. Non-authoritative information organisation**

For digital collections, “non-authoritative information organisation” was defined as provision of the ability to:

- publicly label digital objects, for e.g. through social tagging
- publicly collate digital objects, for e.g. through the creation of a digital gallery

This principle is related to the principle of trust in the community. It is similarly based on the Web 2.0 ethos of acknowledging user perspectives and needs. Supporting non-authoritative information organisation in digital collections can help improve the discoverability of the content of the collections. Allowing users to define alternative pathways, or access points, into digital collections is one means of bridging the semantic gap that exists between how CHIs catalogue and arrange content and how users search for them. Non-authoritative information organisation can allow digital collections to move from an institutionally defined information-space into a situationally-defined one (Trant, 2009, p. 20), where content can surface based on the user’s personal needs.

23 of the 72 (32%) collections analysed supported the non-authoritative organisation of their content. Table 10 and Figure 6 summarise the use of this principle in digital collections across types of CHIs and their location. 65% of the digital collections that supported this principle belonged to Australasian CHIs while 35% belonged to North American ones. This difference is similar to what was found in Section 6.1.3.2, but again there appears to be no discernible reason for this difference.

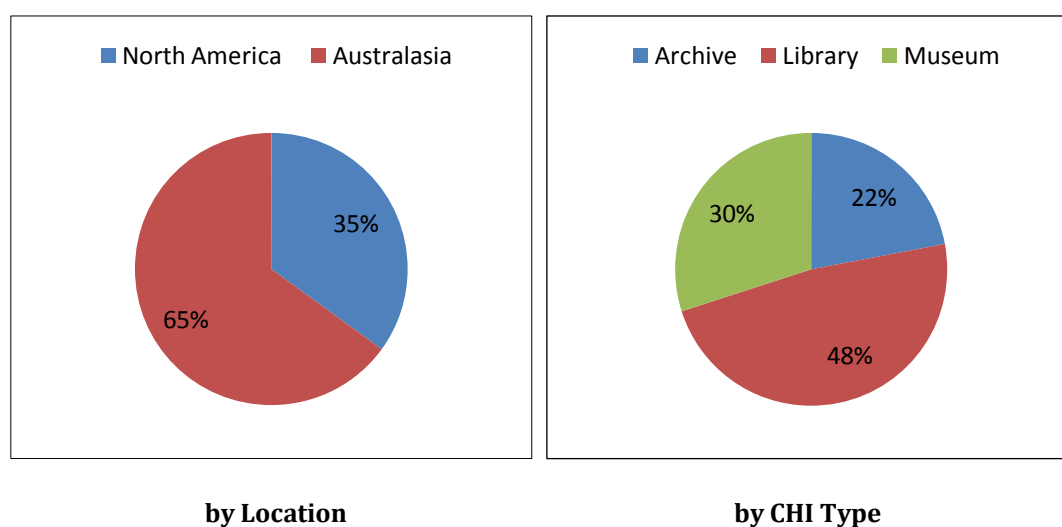
Of the 23 collections that supported the principle, 48% belonged to libraries, 30% to museums and 22% to archives. As was the case in Section 6.1.3.1, these findings appear to be comparable to the different user models the institutions base their service on. The librarian is

usually seen as “an enabler in the discovery phase of the research process” (Trant, 2009, p.2) while the user experience of archives and museums tends towards more mediated encounters – archives and museums use finding aids and institution-assembled sequences of objects to guide the user’s discovery of their content (Trant, 2009). Libraries may perhaps as a result be more receptive towards the idea of user-driven access points compared to museums and archives. Interviews or surveys should be conducted to confirm this.

**Table 10: Number of digital collections that support non-authoritative information organisation**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 2       | 4       | 2      | 8                 |
| Australasia       | 3       | 7       | 5      | 15                |
| Total by CHI type | 5       | 11      | 7      | 23                |

**Figure 6: Percentage of digital collections that support non-authoritative information organisation**



#### **6.1.3.3. High degree of control for users**

For digital collections, “high degree of control for users” was defined as allowing users to:

- control their own data, for e.g. users can post, delete or edit their comments at any time
- share or remix the digital objects in the collection, for e.g. through a Creative Commons license

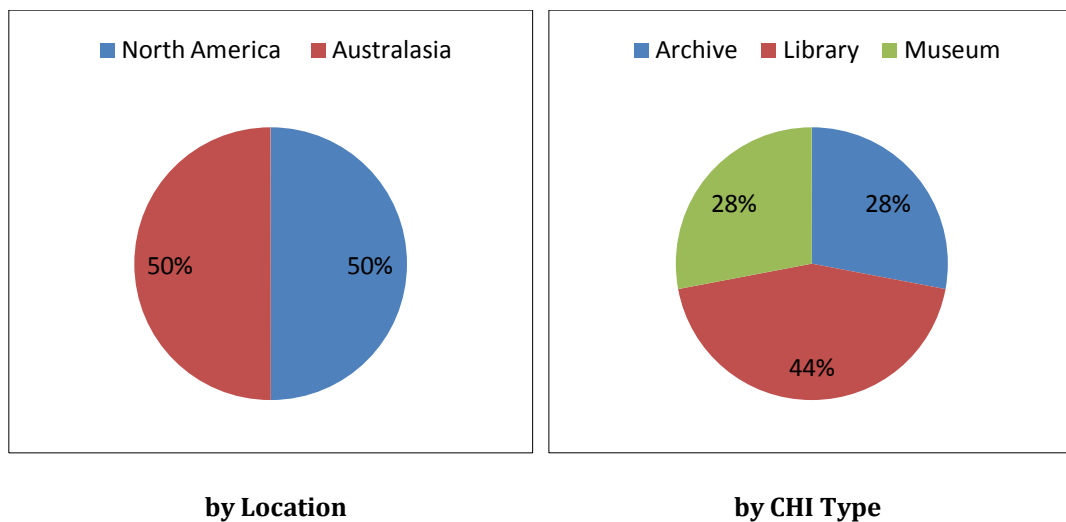
This Web 2.0 principle supports a fluid and dynamic approach to ‘ownership’ online. In terms of digital collections, it takes the principle of trusting the community a step further by moving beyond supporting user perspectives to providing users control over the institution’s content as well as the content they generate. Providing users with the freedom to de-contextualise and re-contextualise the content of the digital collections, by modifying their own existing interactions in the collection or appropriating the content from the collections for their own purposes, involves CHIs letting go of previously rigid notions of their role as arbitrators of cultural heritage.

32 out of 72 (44%) CHIs in the sample studied provided users control of their own content as well as the collection’s. Table 11 and Figure 7 summarise the use of this principle in digital collections across types of CHIs and their location. An equal number of digital collections from Australasian CHIs and North American CHIs were found to be supporting this principle. Of the 32 collections that supported the principle, 44% belonged to libraries, 28% to museums and 28% to archives. These findings support those outlined in Section 6.1.3.1 and 6.1.3.2 and may be accounted for due to the same reasons posited in those sections.

**Table 11: Number of digital collections that provide a high degree of control for users**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 5       | 6       | 5      | 16                |
| Australasia       | 4       | 8       | 4      | 16                |
| Total by CHI type | 9       | 14      | 9      | 32                |

**Figure 7: Percentage of digital collections that provide a high degree of control for users**



#### **6.1.3.4. System improves in usefulness as it is used by more people**

For digital collections, “system improves in usefulness as it is used by more people” was defined as the their ability to displays visual cues to indicate the size and composition of user activity, for e.g. by showing the number of times a digital object has been viewed. This principle relates to the Web 2.0 notion of harnessing collective intelligence and relying on the

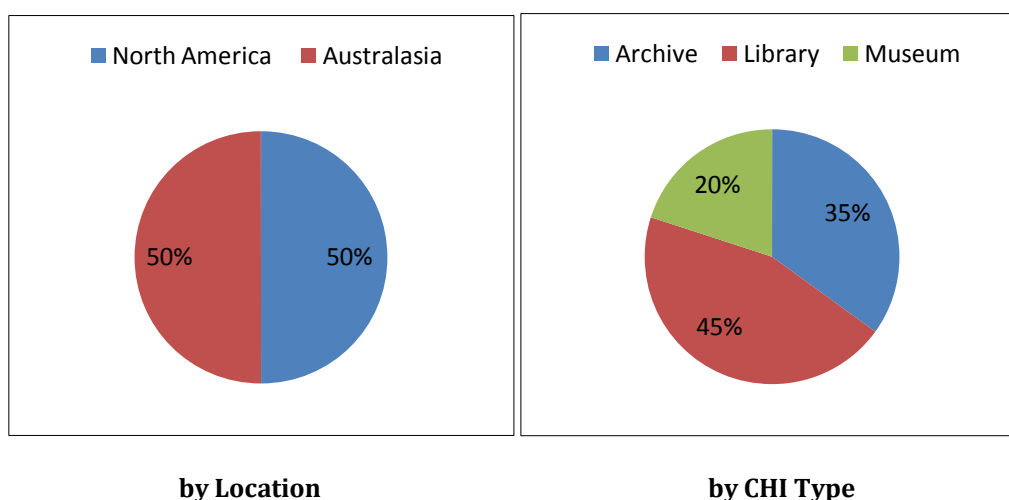
wisdom of crowds. It is a by-product of user participation and allows decisions to be informed by the behaviour of other people (Dieberger, Dourish, Höök, Resnick & Wexelblat, 2000).

20 out of 72 (28%) digital collections were designed to use aggregated user activity to improve their usability. Table 12 and Figure 8 summarise the use of this principle in digital collections across types of CHIs and their location. An equal number of Australasian CHIs and North American CHIs were found to be supporting this principle in their digital collection.

**Table 12: Number of digital collections where the system improves in usefulness as it is used more**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 3       | 5       | 2      | 10                |
| Australasia       | 4       | 4       | 2      | 10                |
| Total by CHI type | 7       | 9       | 4      | 20                |

**Figure 8: Percentage of digital collections where system improves in usefulness as it is used more**



Of the 20 collections that supported the principle, 45% belonged to libraries, 20% to museums and 35% to archives. The libraries appear to be leading the support of this principle as well. Surprisingly noteworthy though is the support for this principle in archival digital collections given their comparatively low support for other Web 2.0 principles. It is possible that the only user activity most archives are allowing, and consequently aggregating, is the number of times a digital object in the collection has been viewed. Perhaps archives have felt comfortable in supporting social navigation because it helps improve the usability of their collections without challenging their authenticity or context.

#### **6.1.4. Web 2.0 count**

In order to summarise the manner and extent to which digital collections have embraced Web 2.0 principles a Web 2.0 count was done. The Web 2.0 count was defined as the number of Web 2.0 principles that a CHI was found to have adopted for its digital collection. Table 13 summarises this information.

49% of the CHIs in the sample have adopted at least one Web 2.0 principle for their digital collection. When this figure is compared to the findings from Section 6.1.1, it appears that the number of CHIs that have embraced Web 2.0 collections for their digital collections is higher than what a cursory investigation into the matter would reveal. Section 6.1.1 noted that only 25% of the digital collections in the sample were hosted on third-party Web 2.0 applications. The difference between the two percentages indicate that some of the 75% CHIs that chose not to use Web 2.0 applications for their digital content have nevertheless embraced a Web 2.0 approach to their digital collections in their own websites or the collaborative cultural heritage websites that they use. It may be deduced that while these CHIs find, for whatever reason, third-party Web 2.0 applications unsuitable, they are not unreceptive to the idea of a

more participatory approach to their cultural heritage content. The percentage of CHIs that were interested in using Web 2.0 applications for purposes other than hosting their digital collections, as outlined in Section 6.1.2, was 67%. It appears that not all CHIs that were found to be interested in Web 2.0 in general have made their digital collections Web 2.0-enabled. As mentioned in Section 6.1.2 further investigation is required to explore the reasons behind this.

**Table 13: The number of Web 2.0 principles that CHIs have adopted for their digital collections**

| Number of Web 2.0 principles met | Number of digital collections |
|----------------------------------|-------------------------------|
| 0                                | 37                            |
| 1                                | 2                             |
| 2                                | 10                            |
| 3                                | 5                             |
| 4                                | 3                             |
| 5                                | 15                            |
| Total                            | 72                            |

Table 14 and Figure 9 summarise how many CHIs were found to support at least one Web 2.0 principle in their digital collections, by CHI type and location. As expected from the findings in Section 6.1.3, libraries appear to be leading the provision of Web 2.0-enabled digital collections while the archives and museums appear to be at a similar stage in the extent of their adoption of Web 2.0 applications and principles for their collections. As has been speculated in Section 6.1.3, these findings may be explained by the differences in the purpose, user models and intellectual traditions of the institutions. The fact that Australasian CHIs appear to be more proactive in supporting a Web 2.0 ethos in their digital collections compared to their North American counterparts is perhaps the most surprising but unaccounted for finding.

**Table 14: Number of CHIs that support at least one Web 2.0 principle**

|                   | Archive | Library | Museum | Total by location |
|-------------------|---------|---------|--------|-------------------|
| North America     | 5       | 6       | 5      | 16                |
| Australasia       | 5       | 8       | 6      | 19                |
| Total by CHI type | 10      | 14      | 11     | 35                |

**Figure 9: Percentage of CHIs that support at least one Web 2.0 principle**

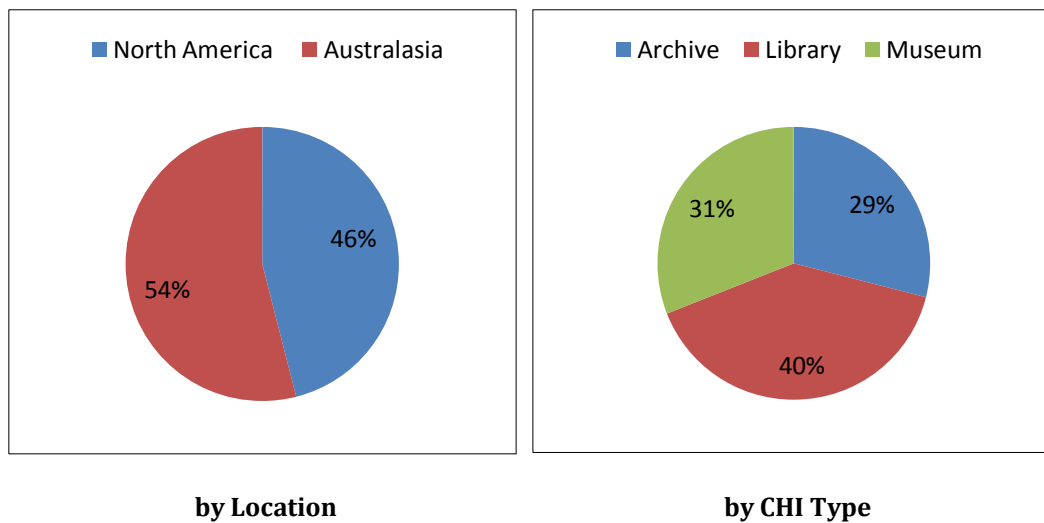
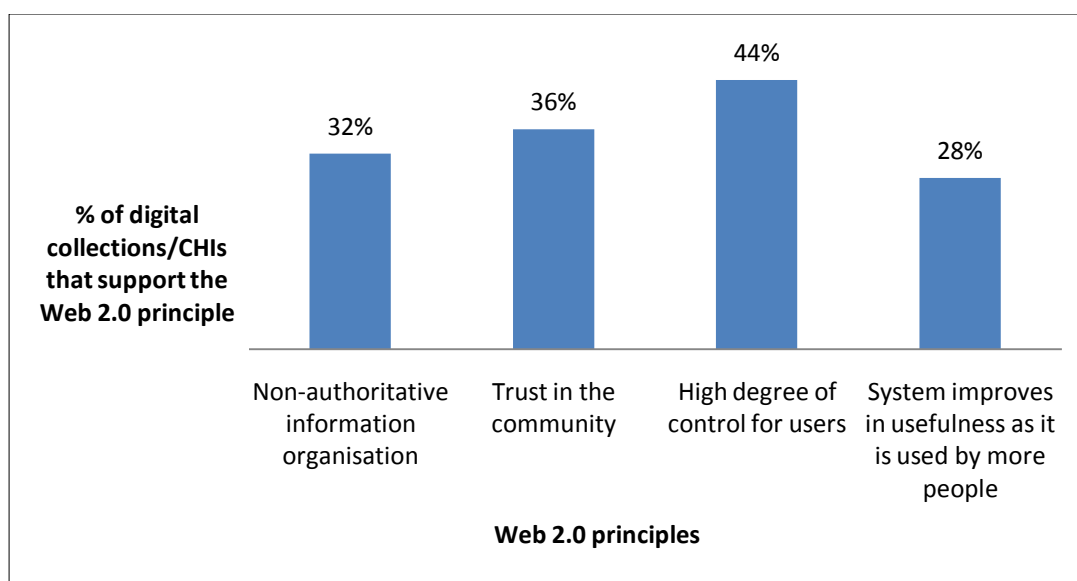


Figure 10 compares the extent of adoption of various Web 2.0 principles in digital collections. Providing users with a high degree of control appears to be the most supported Web 2.0 principle. It may seem surprising that more CHIs have provided users with a high degree of control compared to the number of CHIs that have demonstrated trust in their community of users but this difference is explainable. The principle “high degree of control for users” was

defined as providing user control over their own data and providing users control over the collection's content. One example of the latter is allowing users to share and remix the content of the collections. During content analysis it was observed that some digital collections hosted on CHI websites provided buttons to allow easy sharing of the URL of the digital object the user was viewing and provided information about Creative Commons licensing but had no other Web 2.0 functionality available. It may be that CHIs are comfortable with online user-activities that happen with their content as long as they occur "off-stage". These CHIs may consider managing and sustaining user interactions too time consuming or distracting from their primary purpose but at the same time do not want to restrict those users who do want to engage with their content online. It is possible that providing users control in this manner is seen as a healthy compromise. Further investigation in the form of interviews or surveys with CHIs would be required to confirm this conjecture however.

**Figure 10: Percentage of digital collections that support the Web 2.0 principles outlined**



It is interesting that overall the principle “System improves in usefulness as it is used by more people” is the least supported in digital collections, even though it does not fundamentally challenge the traditional role of CHIs as arbitrators of cultural heritage, unlike the principles “non-authoritative information organisation” and “trust in the community”. Aggregating existing user activity on the content of digital collections, even if the activity is only the number of times an object has been viewed, is one means of highlighting popular content in digital collections. Passers-by who are new to the collection and are simply browsing may find it helpful to see which content in the collection draws the most eyeballs or attracts the most user activity. They may become users of the collection themselves if, having accessed the content, they feel compelled to respond to existing user responses or the content. More CHIs should perhaps be taking advantage of this strategy of passive invitation to participate.

## ***6.2. The nature of online participation***

The forms of online participation that a user engages in with digital collections depends on the Web 2.0 affordances available through the digital collection as well as the user’s interest in taking advantage of those affordances. Content analysis was done of the 35 digital collections that were identified as having adopted a Web 2.0 approach to determine what forms of online participation each collection offered and what forms users engaged with.

### **6.2.1. Join**

Any online participatory activity that allows users to display their interest in a digital collection through an online public profile was classified as type “Join”. This definition intentionally prevented the inclusion of those instances where CHIs sought the registration of users solely for authentication purposes. Maintenance of an online public profile has become

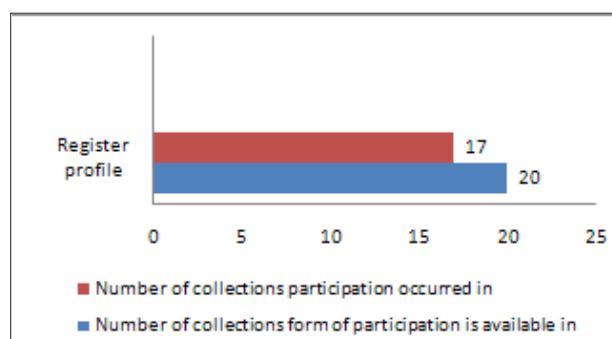
one of the mainstays of Web 2.0 applications. The public profiles of users on Web 2.0 applications usually allow them to outline their interests and display the activities they have participated in on that platform.

Table 15 and Figure 11 summarise the join-type activities available for digital collections. Of the 35 CHIs that were identified as having adopted a Web 2.0 approach for their digital collections, 57% allowed users to display their interest in the institution and their activity in a collection through a public profile. In 85% of the cases at least one user took advantage of this form of online participation.

**Table 15: Forms of participation of type "Join"**

|   |  |
|---|--|
| Join  | Register public profile that displays user's activity in digital collections |
| Number of collections the form of participation is available in | 20   |
| Number of collections participation occurred in                 | 17   |

**Figure 11: Forms of participation of type "Join"**



90% (18) of the 20 CHIs that offered participation in this form were hosting their digital collections on Flickr. Flickr allows users to add other users as “contacts”. Adding a user as a contact means that users can keep up-to-date on what content has been uploaded by the user from their own home page. Additionally, when a user marks an object from any collection as a favourite on Flickr the object becomes visible on their profile page under a heading titled “favourites”. This form of online participation is useful for users as they can subscribe to the content a CHI provides so they don’t have to keep checking back to see if new digital collections have become available.

10% (2) of the digital collections that allowed participation through registering profiles were located on institution-run websites. In those cases the user was allowed to maintain a public profile on the website and the profile displayed the content that they had contributed to the collections on the website.

### **6.2.2. Converse**

“Converse” refers to those online participatory activities that support conversation about the content in digital collections on other Web 2.0 applications users frequent. Support for such activities stem from the recognition that users use a variety of Web 2.0 applications and it is not possible for CHIs to be present on every one of them. One advantage of facilitating engagement with digital collections in this manner is that it enables the promotion of the collections to hitherto unreached users by ‘word of mouth’ of those users who are interested enough to converse about the collections on their own online space.

CHIs appear to be promoting conversations in this manner by allowing users to participate in the sharing of their content. Table 17 summarises the converse-type activities available for

digital collections. 69% (24) of the 35 digital collections that were identified as Web 2.0-enabled provided a set of buttons of other Web 2.0 applications next to the objects in their collections. Users click the button that represents their Web 2.0 application of choice to quickly and easily share the digital object they are currently viewing. Depending on the purpose and interface of the Web 2.0 application the user selected, clicking the button either leads to the user sharing the URL of the object they were viewing or the digital object is embedded into their Web 2.0 application page with a link back to the digital collection.

Social networking sites such as Facebook and Twitter, blogging sites such as Blogger, Livejournal and Tumblr, and social bookmarking and navigation sites such as Digg, Delicious and Stumbleupon were among those that digital collections supported the sharing of their content to. Since sharing the content of digital collections leaves no trace in the collection or on the digital object's page no means was available of checking whether users were taking advantage of this form of participation.

**Table 16: Forms of participation of type "Converse"**

|   |  |
|---|--|
| Converse  | Share digital object on other Web 2.0 applications |
| Number of collections the form of participation is available in | 24   |
| Number of collections participation occurred in                 | Unable to verify                                   |

### 6.2.3. Collect

“Collect” refers to those online participatory activities that support the organisation and classification of content in digital collections. It is related to the Web 2.0 principle “non-authoritative information organisation”. As explained in Section 6.1.3.2 such participatory activities can help improve the discoverability of the content of digital collections by allowing users to define alternative access points into them.

Table 17 and Figure 12 summarise the collect-type activities available to users through digital collections. 49% of the 35 digital collections identified as Web 2.0-enabled allowed user participation in digital collections through tagging. Tagging encourages users to add relevant keywords or labels to digital objects with the aim of improving their findability. Following the *steve.museum* (<http://tagger.steve.museum/>) project in 2005 and the Library of Congress’ (Springer et al, 2008) pilot project on Flickr’s The Commons in 2008 CHIs have started becoming interested in exploring how social tagging can be used to improve user accessibility to their collections. While the number of digital collections that offer tagging, 17 may seem closely linked to the number of digital collections that are hosted on Flickr, 18, it is worth noting that Flickr allows users to turn off various functionality and during content analysis of the collections it was observed that a few CHIs had disabled tagging on their digital collections.

2 of the 17 digital collections that supported tagging were located on institution-run websites while another 2 were hosted on collaborative cultural websites. In all 4 of these cases there was no means of distinguishing tags created by users compared to tags added by the CHI. Due to this reason the actual number of instances where at least one user had participated in the collection using tagging was unable to be verified. It was observed, however, that in the

13 digital collections where this participation could be verified participation through tagging occurred in only 46% (6) of the collections.

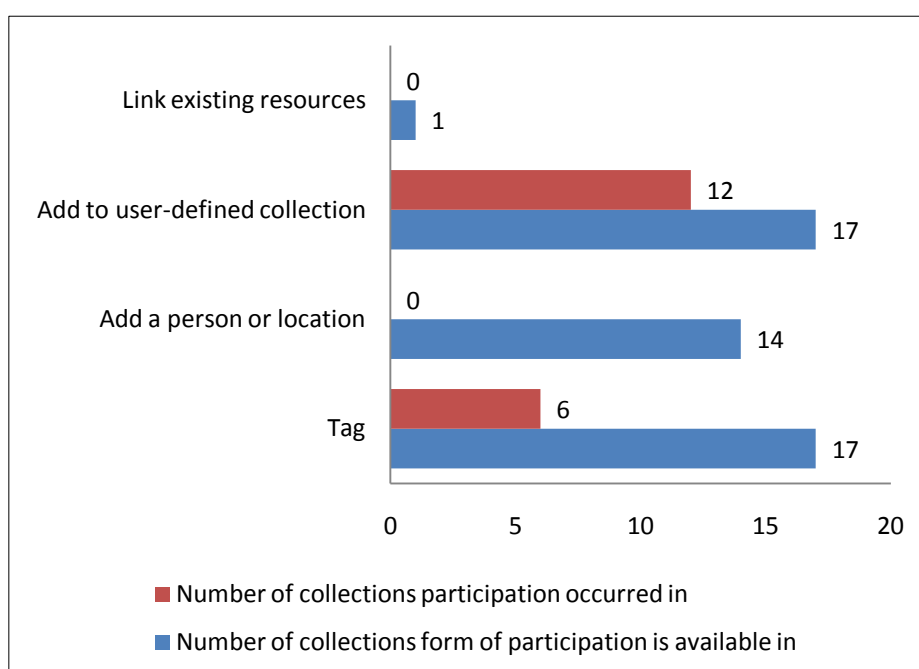
Another type of participatory “collect” activity that digital collections were observed to offer was the ability to add content from digital collections to user-defined collections. 49% of the 35 Web 2.0-enabled digital collections offered the ability to add content to user-defined collections. This form of activity was only found available on digital collections that were hosted on third-party Web 2.0 applications. CHIs could turn this feature off in the third-party Web 2.0 applications that the collections were found using (namely, Flickr and Youtube) if they wanted to. It was found that 16 of 17 digital collections that supported addition to user-defined collections were hosted on Flickr. Flickr provides users the ability to create galleries, where they can curate up to 18 photos or videos available from other Flickr members. The remaining digital collection that supported addition to user-defined collections was hosted on Youtube. Youtube provides users the ability to create playlists, where users can curate as many videos available from other Youtube members as they wish.

Adding content to user-defined collections appeared to be the most popular collect-type activity among users, with 71% of the 17 collections garnering participation in this format at least once. Other forms of participation that CHIs offered through digital collections included allowing users to add people or locations to digital objects and allowing users to link existing resources. The latter was available through institution-run websites where the content of the digital collections was largely unstructured because users were allowed to contribute content to the websites.

**Table 17: Forms of participation of type “Collect”**

| Critique  | Tag                           | Add to user-defined collection | Add person/<br>Add location | Link existing resources |
|---|-------------------------------|--------------------------------|-----------------------------|-------------------------|
| Number of collections the form of participation is available in | 17                            | 17                             | 14                          | 2                       |
| Number of collections participation occurred in                 | 6 (unable to verify for some) | 12                             | 0                           | 0                       |

**Figure 12: Forms of participation available compared to forms of participation used**



## 6.2.4. Critique

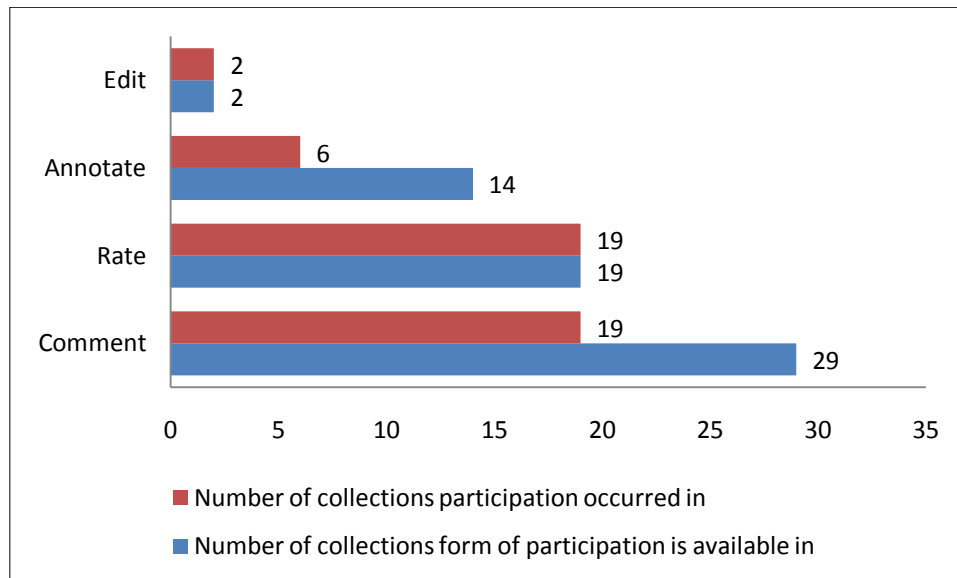
“Critique” refers to those online participatory activities that allow users to react to the content in digital collections in the online space they are available from. It is closely related to the Web 2.0 principle “trust in the community”. As explained in Section 6.1.3.1 such participatory activities can encourage multivocality and the emergence of community-based relevancy.

Table 18 and Figure 13 summarise the critique-type activities available to users through digital collections. 83% of the 35 digital collections identified as Web 2.0-enabled allowed user participation in digital collections through commenting. It appears that commenting is the most ubiquitous form of participation available through Web 2.0-enabled digital collections. In 66% of the collections that allowed commenting, participation in this form occurred at least once.

**Table 18: Forms of participation of type "Critique"**

| Critique  | Comment | Rate | Annotate | Edit |
|---|---------|------|----------|------|
| Number of collections the form of participation is available in | 29      | 19   | 14       | 2    |
| Number of collections participation occurred in                 | 19      | 19   | 6        | 2    |

**Figure 13: Forms of participation of type "Critique"**



The second most popular means of allowing critique of content was through rating of digital objects, which was supported in 54% of the Web 2.0-enabled digital collections. In every single one of those collections participation through rating occurred at least once. Users rated content by declaring favourite objects, or indicate like or dislike of the object. This form of participation is probably so well-used across collections because it does not require much effort on the part of the user, other than the click of a button. Additionally, doing so adds the content to an easily-accessible list in their Web 2.0 account, which is potentially the primary motivating factor in participating in this activity.

40% of the Web 2.0-enabled digital collections allowed participation through annotation but in only 43% of the cases this form of participation was used at least once in the collection. Annotation was a form of participation that only appeared to be available on digital collections hosted on Flickr. Though 18 digital collections were hosted on Flickr it appears

only 78% of the time CHIs continued to allow annotations on their collections. Observations during content analysis indicated that the annotation interface was not very easy to use as the presence of a lot of annotations on the object made it hard to follow them. On Flickr annotations appear as a layer on the digital object when the user hovers their mouse over it, this can be unnecessarily distracting from the photo. Although only interviews or surveys with the CHIs can confirm so, these are likely to be the reasons some institutions preferred to disable annotations on their collections. During the content analysis it was observed that the annotations were being used to identify small details in the digital object, question particular aspects of a digital object or point to parts of the digital objects that users liked.

Only 2 digital collections, both located on institution-run websites which also allowed users to contribute content to it, allowed users to edit the content of their collection. This form of participation is closely linked to the Web 2.0 principle “high degree of control for users”.

### **6.2.5. Create**

“Create” refers to those online participatory activities that support the contribution of user-generated content in response to the content in the digital collections. During the content analysis only 9% of the Web 2.0-enabled digital collections were found to be offering a means of participation in this manner. One collection, hosted on Youtube, allowed users to post video responses, however so far no user had participated in this manner in the collection. Two other collections, hosted on institution-run websites, allowed users to share their own pictures that were relevant to the topic of the collection. In both cases participation in this manner did occur within the collections. Table 19 summarises these figures.

**Table 19: Forms of participation of type "Create"**

| Create  | Video Response | Upload Content |
|---|----------------|----------------|
| Number of collections the form of participation is available in | 1              | 2              |
| Number of collections participation occurred in                 | 0              | 2              |

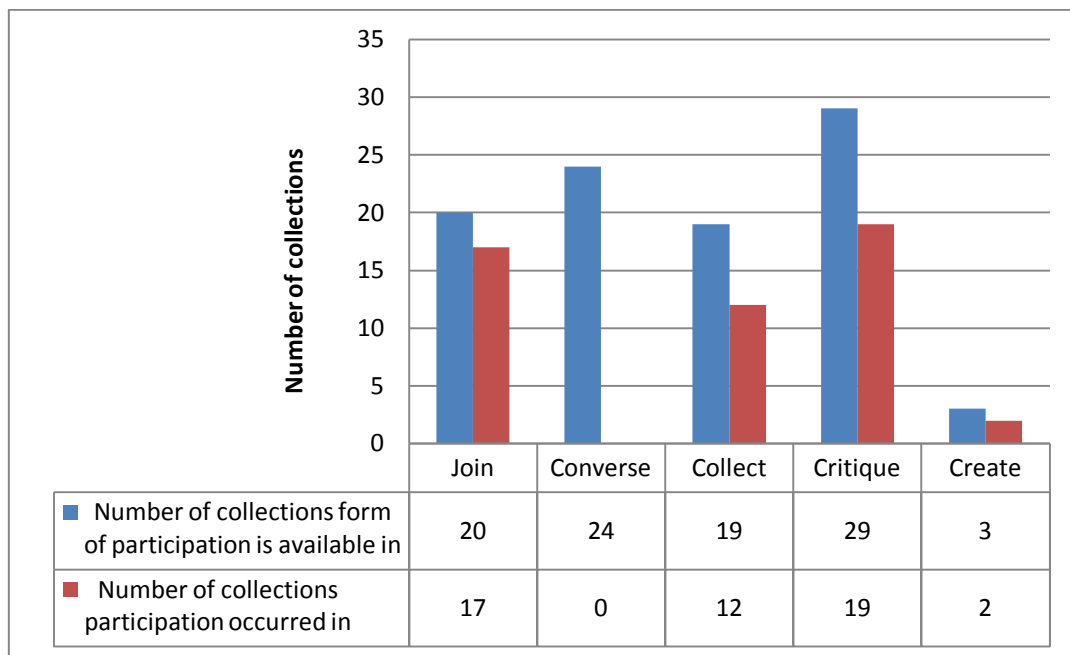
While support for create-type activities appears to be low there is one reason the findings reported are misleading. 13 of the 35 Web 2.0-enabled digital collections, that is 37% of the collections, noted that the content of their collections were under licenses that supported remixing. This is not accounted for in Table 19 because licensing information does not qualify as a form of participation, though it is a factor conducive for participation.

### **6.2.6. Comparison**

Figure 14 summarises the findings for Section 6.2 by comparing support for various types of participation in digital collections with the occurrence of participation. With the exception of create-type participatory activities, most CHIs appear to be supporting a range of participation levels for the users of their digital collections. Critique-type activities appear to be leading in both support for such activities in the collection and occurrence of participation in such activities. In comparison the occurrence of participation in collect-type activities appears to be low. Given that collect-type activities can improve the discoverability of the content in digital collections it may be that CHIs need to investigate reasons for the lack of participation in those types of activities and see whether they can encourage user participation for them. As indicated earlier, converse-type and create-type activities seem hard to gauge as participation

often occurs “off-stage”, away from the digital collections. It may be that a more focused investigation of these participatory forms is required in the form of case studies to explore what CHIs and users are doing on this front.

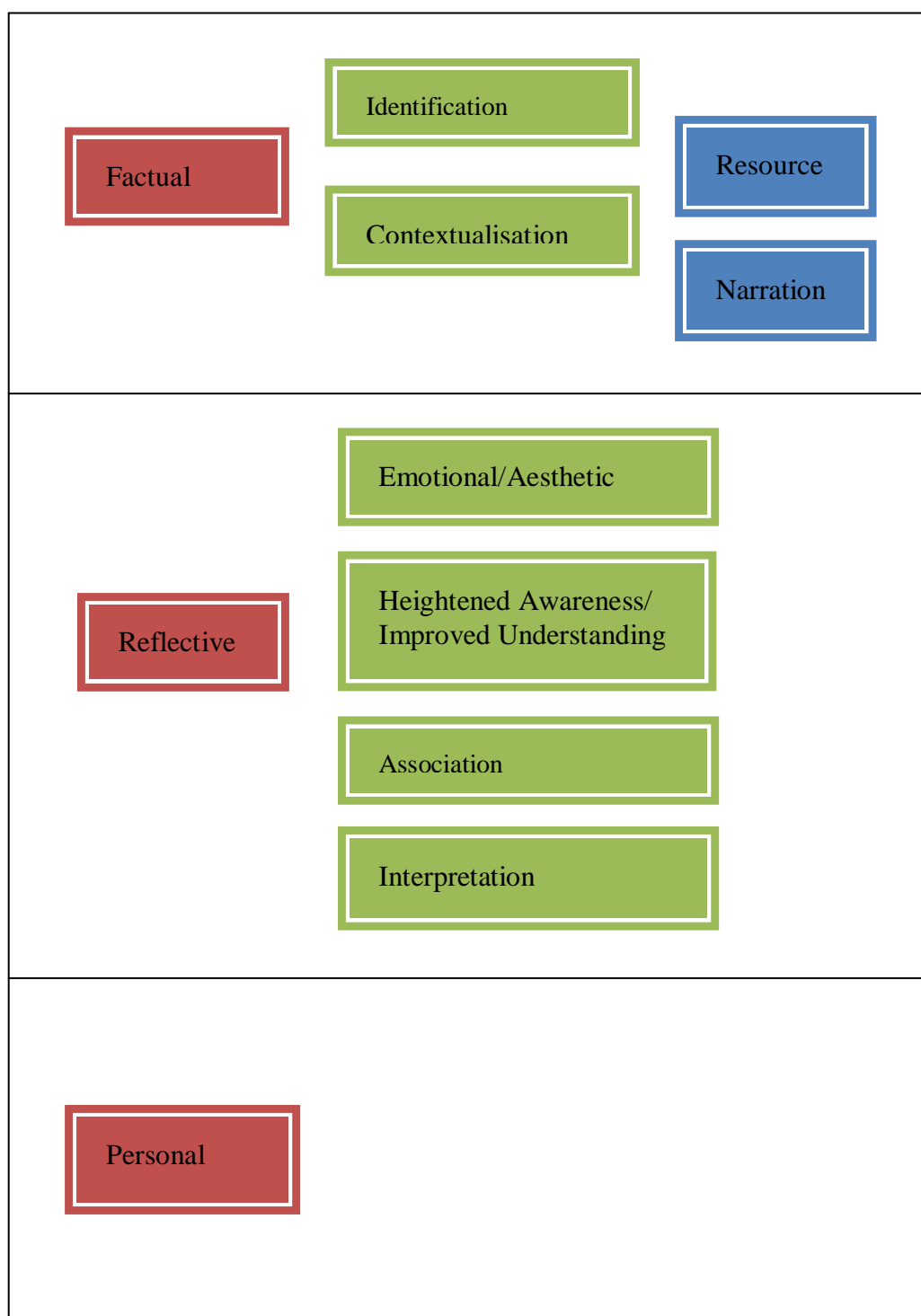
**Figure 14: Comparison of participation types**



### 6.3. *The nature of user responses*

In order to gain a richer understanding of the nature of user participation in digital collections this research investigated the comments that users left on digital objects. The model depicted in the figure below was developed as a result of the content analysis conducted:

**Figure 15: Classifying user responses**



Classification of the user comments was done based on the content of the responses. The user responses in the sample were characterised broadly as being factual, reflective or personal. It is important to note that the comments did not exclusively belong to one category or another, but usually most user responses had a dominant theme and the categorisation was done based on this.

The aim when creating the model was to outline the kinds of responses that CHIs should expect when enabling multivocality in their digital collections. Being able to anticipate types of user responses should allow CHIs to plan in advance their own stances on the various types of responses that will be received. CHIs may wish to give due consideration to strategies they can employ to encourage or discourage certain types of responses. This model is by no means a comprehensive one.

### **6.3.1. Factual**

Factual responses were defined as those that seek to establish or provide facts on what was being depicted in the digital object. Some responses belonging to this category focused on providing identifying information where digital objects were lacking in it, as in Example Excerpt 1, or where the CHI had indicated they were uncertain about the information they had. Other responses sought to provide resources, such as links, for anyone who was interested in exploring the subject of the digital object further. Example Excerpt 2 depicts such a case. The third type, depicted in Example Excerpt 3, was those responses that were educational in nature. They appeared to be motivated by an interest in sharing knowledge or trivia that may intrigue users or help them gain a broader contextual understanding of what they were viewing.

Factual responses can prove to be of great help to CHIs who often have a vast number of cultural heritage content at their disposal but sometimes little contextual or identifying information about them. Allowing the community to play 'history detectives' (Springer et al, 2008) can not only be beneficial for the CHI but also perhaps be satisfying on an altruistic level for those users contributing their expertise and satisfying on an educational or entertainment level for those using the exercise as a means of conducting research on a subject that intrigues or interests them. One question that arises from this is whether CHIs should consider it their responsibility to verify the facts that their users have provided on their collections. Another area that needs investigation is whether CHIs should consider updating their catalogues with the newfound information from factual responses.

#### **Example Excerpt 1: Factual-Identification**

I think Bernard's 1940's is a little early. The Morris Minor in the crash is about a 1954 model and down the road is a mid-50's Holden.

#### **Example Excerpt 2: Factual-Contextualisation-Resource**

1821 it was built - Imagine somebody trying to knock that down nowadays!

Governor Macquarie was closely involved in this building -

<http://www.bensoc.org.au/director/aboutus/benevolentsocietyhistory/lachlanmacquariefoundingp atrontbs.cfm>

The Benevolent Society has been involved in magnificent work over nearly 200 years -

<http://www.bensoc.org.au/director/aboutus/benevolentsocietyhistory/historytimeline.cfm>

#### **Example Excerpt 3: Factual-Contextualisation-Narration**

Originally known as the "Male Chronic Building" at the time that this panorama photograph was taken. Renamed West Lawn in 1950. This was the first large permanent building, built at the "Hospital for the Mind" at Mount Coquitlam. Construction started in 1909, and was finished in 1913. The name was quickly changed to Essondale Branch Hospital, in 1913, to avoid confusion with another post office, at the newly formed city of Port Coquitlam. Quickly being shortened to Essondale, after Henry Esson Young. The entire site was renamed again in 1950, as Riverview Hospital

Some of the history of this building is contained in my West Lawn blog. West Lawn has been closed since 1983, and unfortunately has not been maintained since that time. Portions of the original Pitt River road, alignment are clearly shown in this picture at the bottom right. The building to the right of West Lawn, with the tall chimney, is the original boiler house. All of the buildings shown in this photo, are now gone, except for the West Lawn building.

### 6.3.2. Reflective

Reflective responses were defined as consisting of reactive commentary on the subject of the digital object. Reflective responses ranged from throwaway remarks to measured responses.

The most dominant type of reflective response in the sample of comments investigated is depicted in Example Excerpt 4 and was labelled “Emotional/Aesthetic”. These responses were typically a word or a line expressing the user’s delight or disgust at what they were viewing. Though this matter needs further investigation, observations during this research appeared to indicate that responses of this nature were influenced by the culture of where the digital collection was located online and to some extent the nature of the digital object.

Digital objects on Flickr tended to receive a large number of Emotional/Aesthetic comments that praised the ‘shot’ or the ‘frame’ or what was depicted in them. This is not entirely surprising as Flickr is a popular photo sharing application and the majority of the digital collections contained digitised historical photographs. An advantage of hosting digital collections on third-party Web 2.0 applications is the possibility of their exposure to audiences that may not have otherwise sought out their content. Most of those responding in an emotional/aesthetic manner on digital collections hosted on Flickr were likely photography enthusiasts rather than cultural heritage enthusiasts.

Conversely the disadvantage in using third-party Web 2.0 applications is probably the ratio of such, what some may consider, distracting or content-less comments on digital objects compared to other types of user responses. CHIs that are considering making their digital collections Web 2.0-enabled need to decide whether they wish to be accepting of all sorts of

user responses or whether they wish to avoid their digital objects becoming ‘cluttered’ with certain kinds of, possibly unwanted, user responses.

**Example Excerpt 4: Reflective-Emotional/Aesthetic**

Lovely filter and beautiful shot ;)))))) congrats!!!

Other types of reflective responses included those where the users were interested in critically reflecting on the subject matter of the digital object with the aim of developing a better understanding of it. This occurred either individually where the user would remark upon or question a detail they considered salient, as in Example Excerpt 5, or collectively when users would start discussing what was depicted in the digital object in order to improve each other’s understanding, as in Example Excerpt 6. For CHIs managing digital collections it is important to give consideration to whether they want to take advantage of such teachable moments to provide information that may help further the understanding of their users or whether they would like the discussion to continue in peer-teaching mode. Another notable manner in which users reflected critically on digital objects was by comparing historical details with current ones, in some cases by sharing visual examples such as pictures taken recently in the same location as depicted in the digital object.

**Example Excerpt 5: Reflective-Heightened Awareness/Improved Understanding**

Interesting to see butter given a separate category from milk & milk products!

**Example Excerpt 6: Reflective-Heightened Awareness/ Improved Understanding**

A tax, tariffs, trade and commerce issue. Not so strange in that context. Try importing a load of Butter from Mexico and call it Margarine to try and get a lower duty. They would do the same thing or worse to you now.

As mentioned in Section 4.3, and as demonstrated by the findings in this section, the act of cultural heritage consumption is a complex one and users tend to engage with cultural heritage in a variety of different manners. Selby (2010) has noted that usually visitors move beyond the consumption of signs and symbols of cultural heritage and become involved in acts of representation by adding their own interpretations. Responses of the kind in Example Excerpt 7 were characterised as being associative. In these responses users would draw on familiar symbols, imagery, and pop culture or historical references to share the perspective that they were viewing the digital object from. Responses of the kind in Example Excerpt 8 and 9 were characterised as interpretive as users tried to speculate about and describe what they saw in the digital object. Responses ranged from earnest ones as is the case in Example Excerpt 8 to facetious ones where users used humour to lend a new perspective to the image, like in Example Excerpt 9.

#### **Example Excerpt 7: Reflective-Association**

This pic reminds me of the dvd movie cover for "Once Upon a Time in America" Its amazing the construction of the Manhattan bridge still stands strong today.

#### **Example Excerpt 8: Reflective-Interpretation**

Looks like they may have been training draughtsmen in lettering styles, or they were trying to get the surveyors to standardise their lettering on maps and plans. see the alphabet on the blackboard....

#### **Example Excerpt 9: Reflective-Interpretation**

Perhaps she is a spy. The application of lipstick is the sign "I've made the drop". The redish-purple purse was the how she would be identified. The FSA (Farm Security Agency) was tracking her every move...

Viewing examples of interpretive and associative user responses reveals the potential for CHIs to capitalise on the interest of their users in engaging with their digital content in an imaginative manner. In order to encourage participation CHIs can develop digital collections that contain objects that lend themselves well to associative and interpretive responses and actively invite users to participate by discussing what movie scenes the image may be reminiscent of, for example, or have them write short stories based on an object from the collection.

### **6.3.3. Personal**

Personal responses were defined as those where users added value to digital objects by sharing first-hand experience or family histories that were relevant to the subject of the digital object. Personal responses ranged from the very brief, as in Example Excerpt 10, to the very verbose such as the more than 1000 word long family history one user provided on a digital object, an extract of which is depicted in Example Excerpt 11. Observations made during the content analysis seemed to indicate that personal user responses encouraged further user participation as other users offered to share their experiences and thoughts on the matter or felt compelled to ask for further details. This appears to be in line with Bagnall's (2003) suggestion that sites where a variety of discourses are present beget increased multivocality.

#### **Example Excerpt 10: Personal-Relation**

The Kiosk was my grandmother's childhood home.

#### **Example Excerpt 11: Personal-Relation**

In the early fifties downtown Brockton was changing and the business was changing. My parents decided to remodel the Tea Room which had beautiful mahogany paneling and booths, a marble soda fountain, black glass table tops and oval top mirrors. It became a modern fifties luncheonette and the name was changed to Sylvia Restaurant and that was when I worked there. My sister and I started out working by "typing the menus." Every day the specials changed and there was a typed menu that was added to the plastic covered Sylvia menu, which had an oval old-fashioned picture of "Sylvia." (I wish I had a copy of that menu.) I was told Sylvia was a pretty girl who came over on the Mayflower. The Greek immigrants wanted to assimilate into American life so they thought the Mayflower was all American. My mother remembered that when they first opened the Tea Room, she spoke to my father in Greek and he told her to go to the back room to talk to him, as customers didn't like to hear a foreign language. She was so upset, she vowed to learn English. She attended night school and continued for many years, first for English and to become a citizen and then for other classes.

### 6.3.4. Exclusions

During content analysis of the 315 comments in the sample only 2 were found to be spam. The model of user responses developed did not include spam in its comments because from the literature read during the literature review and from observations during this research it appears the amount of spam in digital collections is currently insignificant. Also intentionally excluded from the model of user responses were “Invitation to Add” comments, as depicted in Example Excerpt 13. These comments were present in digital collections hosted on Flickr and are a by-product of a feature on that Web 2.0 application where users can create groups and invite other users to add their images to the group. These types of comments have not been accounted for in the user model because they currently appear to be application-specific and only relevant for CHIs considering Flickr.

#### Example Excerpt 12: Invitation to add

Hi, I'm an admin for a group called ♥♥♥♥GIRL P0WER♥♥♥♥, and we'd love to have this added to the group!

## 7. Conclusion

One aim of the research was to assess the extent to which cultural heritage institutions have adopted Web 2.0 applications and principles for their digital collections. Findings suggest that the cultural heritage sector has been comparatively slow in making digital collections Web 2.0-enabled though a large number of institutions have started exploring Web 2.0 for other purposes. Australasian cultural heritage institutions rated comparatively better compared to their North American counterparts in adoption of Web 2.0 applications and principles for their digital collections. Libraries appeared to be leading the adoption of a Web 2.0 ethos in digital

collections, compared to museums and archives, by demonstrating trust in their online community, encouraging non-authoritative information organisation, providing users with a high degree of control and enabling their systems to improve in usefulness as they are used by more people. The majority of cultural heritage institutions that were Web 2.0-enabled were found to be supportive of the idea of allowing users to control their own data as well as taking control of content in the digital collections for sharing or remixing purposes. It was noted that while in the past traditional differences between archives, libraries and museum allowed them to approach users and their content in different manners, online these institutions may need to adopt a more unified approach that complements the current Web 2.0 environment.

Another objective of this research was to understand the participatory environment of digital collections. Investigation into the matter revealed that some cultural heritage institutions understand the need for participatory activities with varying degrees of involvement.

Participatory activities on offer ranged from creator-friendly experiences that allow open-ended self-expression to more intermediate forms such as rating or organising activities.

Activities that supported multivocality around the content of digital collections, especially in the form of user comments, were the most ubiquitous in Web 2.0-enabled digital collections along with rating and joining activities. They were also the activities that users appeared to take part in most often across digital collections.

The nature of user responses through comments was also explored during this research.

Investigations confirmed that the act of cultural heritage consumption is a complex one and users tend to engage with cultural heritage in a variety of different manners. A model outlining the types of user responses digital collections invoke was provided. It noted that user responses could be broadly characterised as factual, reflective or personal in nature.

Factual responses usually aimed to provide identifying or contextual information, while reflective responses ranged from the often inane emotional/aesthetic ones to the usually creative interpretive or associative ones. It was concluded the cultural heritage institutions need to be aware of the kinds of user responses they may get so they can better strategise how to encourage or discourage certain types.

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