

## **Bringing the Past to the Present**

**The use of tagging and storytelling for the enrichment of digital cultural heritage**

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## **1. Introduction**

The growing impact of information technology and digitisation, ever since the beginning of the 1990s, has given cultural heritage institutions a fresh impulse to deal with the problem of accessibility of their collections (Van Vliet, 2009). Their efforts, however, are still mostly aimed at cultural preservation, and, for the time being, have done little to bring us closer to the dream of a Virtual Collection in the Netherlands. For instance, more than 30 million art objects were still not digitised in 2008 in the Netherlands (Veeger, 2008). Meanwhile, it has become urgent to further open the door. The Internet's dominant role in recent years has caused a change in the relationship between media producers, suppliers and consumers in the traditional media landscape. The cultural sector must therefore decide what to do with today's digital media in response to the general public's changing role, and for the purpose of improving accessibility. The use of multiple media resources and particularly resources like the Internet and mobile telephony seems to be inevitable. The only question that remains is: *how?* This paper addresses this question by focussing on social tagging and storytelling, and reports the results of an empirical study on tagging behaviour using the social tagging platform [www.ikweetwatdits.nl](http://www.ikweetwatdits.nl) (see also Van Vliet et al., 2010).

### **1.1 Increase in accessibility**

Searchability is crucial for the accessibility of our digital cultural heritage. The ability to find digital art objects begins with an effective description. Therein lies the problem. If a description can be found at all, it usually includes only a minimal amount of technical data focusing on object management issues such as documentation of the acquisition process, storage, and art-historical features. Often the same object descriptions are used when art collections are presented on the net. Consequently, any problems in describing the physical art collections are reflected digitally. E.g., as a result of strict annotation standards, the formal description of a painting with the image of a cow might not even include the word 'cow'. As a result, the painting cannot be found using 'cow' as a search term. The art object may become less appealing for the visitor's since it is taken out of

context, and only a database record is shown (Trant, 2006a/b). In conclusion: art collections are available, but not accessible; descriptions have been made, but are incomprehensible.

## **1.2 Social tagging**

The usage of social tagging could offer a possible solution for engaging the public and making object descriptions more public-friendly. Tagging entails assigning labels and/or keywords to a specific item, such as a painting. It is social tagging when multiple people are engaged in this activity, and tags are mutually visible. Various studies suggest tagging has a positive effect, on both the added value for art collections and visitor involvement with those collections (Marlow et al., 2006; Trant, 2006a/b; Trant & Wyman, 2006; Trant, Bearman & Chun, 2007). The frequently mentioned benefits associated with social tagging include:

- Tags provide access points that are closer to the idioms used by visitors than formal object descriptions.
- Tags add new information to art collections that is known to the members of the general public but that is not available to a particular institute (Trant, 2006a).
- Tagging increases people's involvement with art collections: taggers contribute meanings that may provide insight into visitors' perceptions of art collections.
- Tags can be used to personalize access to art collections by making suggestions, composing virtual expositions, route maps, or virtual meeting places for visitors (Van Setten et al., 2006; Trant, 2006b).

## 2. Research questions

The question relating the useful deployment of social tagging can be formulated as:  
*what choices museums have to make for the deployment of social tagging?*

Two such choices have been identified for the purpose of this project. In similar research, researchers usually work with a dichotomy of professionals versus laymen. In doing so, there is little consideration of the different degrees of knowledge among visitors. In addition to the museum curator and the layman, there are ‘well-informed’ interested people including amateur scientists and retired professionals to be found among the visitors (see Wubs & Huysmans, 2006a). It is extremely relevant for museums to cater for and continue to involve this group in their collections. It may be more useful to deploy social tagging for a specific group of experts as opposed to a broad audience.

A second choice is whether or not to go beyond the limited power of expression of tags. No matter how powerful tags may be, they are still essentially keywords with a limited amount of information. It may therefore also be interesting to consider other forms of expression, such as digital storytelling. Stories offer a personal perspective and contribute to a personal interpretation of art objects (see further Van Vliet, 2009). We defined three possible effects of social tagging:

- *Enrichment*: tags enrich collections by way of adding information. Taggers make a statement about art objects and, as a result, tell us something about the relationship between visitors and art objects;
- *Accessibility*: tags can be used as search terms to find art objects;
- *Involvement*: the tagging process creates involvement. Through tagging the visitor is engaged in a process of viewing, analysing and describing the object. One can expect that these cognitive processes will arouse interest in art collections.

The analysis of the three possible effects gave rise to a multitude of research questions and hypotheses (see Van Vliet et al., 2010). Two of these questions will be addressed in this paper:

- 1) *Do laymen tag in different ways compared to experts?*

2) *Which way of presenting stories will lead to a higher degree of involvement?*

### **3. Methodology**

A controlled research environment allowing the collection of tags and stories was of vital importance for our research. We set up this environment by creating a platform 'ikweetwatditis.nl' ('Iknowwhatthisis') through which collections could be presented and where tags and stories could be added. The tagging tool tracked various types of information, such as the actions of users, and stored this information in a database for later analysis. This platform was launched in September 2008. Three collections were made accessible via this environment: 134 objects from the Dental Surgery collection at the Utrecht University Museum, 145 objects from the collection of drawings of Japanese internment camps at Museon and 100 photos from the beetle collection at Naturalis.

We collected data for more than one year, specifically from September 2008 through 31 December 2009. After a year of collecting tags a total of 3,592 tags were collected from laymen and experts. In total 62 stories in the form of video were collected through interviews at the end of 2008, two of which were used in our experiments on storytelling. For more about the selection, methodology, statistical analysis and other design choices we refer to the complete research report (Van Vliet et al., 2010).

#### **4. Findings & conclusions**

Analysing the tags shows that laymen did not add significantly larger numbers of tags than experts nor did they added larger numbers of unique tags than experts. In fact, these two groups added virtually the same proportion of unique tags to the entire collection of tags. Also, laymen did not add different types of tags compared to experts. Both groups primarily added descriptive tags. The two other types of tags (self-reference and attitude) were virtually non-existent in our experiment. However, laymen used different words than experts. We discovered a considerable overlap (almost 50%) between the laymen tags and the expert tags. Only one of the four assessed cases showed a significant association in the ranking of words used by laymen and experts.

The question whether ‘information’ was added through tags by the two groups of laymen and experts has been assessed in two different ways. On the basis of objective measures in regard to the ‘distance’ of both tag clouds, no difference was found in the degree of ‘informativity’ between the laymen tags and the expert tags. The post-experiment research carried out among professionals did reveal, however, that the expert tags are considered to be ‘more informative’. Having professionals examine the suitability of tags for retrieving the object in question assessed whether tags added by laymen are more useful for the purposes of object retrievability than the tags added by experts. Only in two out of the eight cases examined are the laymen tags considered to be better keywords for object retrieval than the expert tags. None of the other cases showed that the expert tags are considered to be better keywords for object retrieval.

The conclusions from the storytelling research are as follows: we discovered that story viewing/listening/reading changed the participants’ attitudes towards museums in a positive sense after the experiment had taken place. There was a more positive attitude towards visiting the museum, museum website, and recommending the museum to friends and family. Furthermore, after the experiment, the human subjects indicated that they were more motivated to visit a museum for their leisure, and less motivated to plan a visit for their work or study. On the other hand, we saw no change in the emotions experienced before and after the experiment. The scores on the emotion pairs indicate that before and after, the human subjects were mainly at ease, calm, passive, and a little

bored but happy nevertheless. Regarding the question on the relationship between the presentation of the story and involvement we used a 2x3 factorial design for measuring media experience. We did a full factorial analysis (MANOVA), which did not show any significant effect on separate factors and their interactions. Univariate analyses of the six dependent variables of media experience did not produce any significant result either. No significant difference in engagement was found in relation to the main effect of modality (video/audio/text) or the main effect of the story (good/poor); neither was there a significant difference found in the interaction effect (modality x story).

## 5. Discussion

One contribution of this research to the discussion of the value of social tagging is the distinction made between different groups, i.e., laymen, experts, and professionals. Research findings show that there was no significant difference between laymen and experts in this respect. Even though there is a substantial overlap in the tags used by both groups, each group also added its ‘own’ words, words that were not mentioned by the other group. Moreover, there was a difference between the relevant weights assigned to the tags shared by both groups: one group mentioned those tags less often than the other group. This was also visible in the tag clouds, in the sense that the laymen did indeed use more ‘common’ words to describe the objects in the dental surgery collection, such as ‘tooth’, ‘back tooth’, and ‘hole’, while the experts used words such as ‘dental caries’ and ‘dental prosthesis’. The most extreme examples were found in the beetle collection, where the experts used specialist terms, usually the Latin names of genera and species, to such an extent that there was virtually no overlap with the terms used by the laymen. Laymen’s terms, such as ‘beetle’, ‘bug’, and ‘black’, were not used by the experts.

In a general sense, we may conclude that both laymen and experts provide their own contributions to digital collections through social tagging. The contributions from both groups are well matched in a quantitative sense, and are (partly) different in nature from a qualitative perspective. Based on this research, therefore, we cannot sustain the assumption that having experts engage in tagging is ‘more productive’ than having laymen engage in tagging. Both groups delivered their own, specific contributions, and the research indicates that the experts’ tags contribute especially to informativity, while the laymen’s tags tend to contribute to retrievability. Apart from the distinction between laymen and experts, we may further conclude on the basis of the research that tagging does indeed enrich collections, in the sense that it adds keywords that have additional value for collections or the disclosure of collections.

Another research contribution is the question pertaining to the role of storytelling in collection enrichment and its potential for eliciting visitor involvement. Not finding any significant results in the assessment of the story presentation was quite an unexpected outcome. We had at least expected that the experience of viewing the video presentation



of a good story would be clearly distinguishable from the experience of reading the textual presentation of a poor story, to mention the two most extreme modalities in the manipulation experiment. A simple explanation for this result is that the difference was just not large enough to emerge as significant with the measurement method used and the limited number of persons interviewed. Another possibility is that the two selected stories ‘meant nothing’, in an emotional sense, to the human subjects (students); in other words: they were simply indifferent.

However we did find a change in attitude towards museums after the experiment: the human subjects have a more positive attitude towards visiting the museum, the museum’s website, and recommending the museum to friends and family. We could discover the exact cause of this change, or to determine its precise relationship with a shift in motivation: from ‘for my work/study’ to ‘for my leisure’. This would mean that simple exposure to stories, by itself, has a positive effect on visitor involvement with museums. Whether this effect would hold in the longer term and whether it would actually lead to action has not been examined.

Taking into account all methodological caveats that we discussed only partially here (see Van Vliet et al., 2010), we may conclude that social tagging and storytelling are relevant tools for museums to enrich their collections. Results for the two other aspects of the benefits of social tagging referred above, i.e. retrievability and involvement, but, in any case, they do not contradict the assumption that social tagging and storytelling contribute to retrievability and elicit involvement. Hereby an essential aspect is to consider who is asked to do what: in addition to the museum professional, a distinction is made between laymen and experts, which has proven to be relevant for clearly interpreting the results. This is inextricably linked to the question of how to reach and influence these target groups in relation to the input they are required to deliver.

## 6. References

Marlow, Cameron, Mor Naaman, Danah Boyd, & Marc Davis. 2006. HT06: Tagging Paper, Taxonomy, Flickr, Academic Article, ToRead. *Proceedings of Hypertext 2006*. New York: ACM Press. URL: <http://www.danah.org/papers/Hypertext2006.pdf>.

Trant, Jennifer. 2006a. Social classification and folksonomy in art museums: early data from the steve.museum tagger prototype. *17th ASIST SIG/CR Social Classification Research Workshop*, November 4, 2006.

— 2006b. Exploring the potential for social tagging and folksonomy in art museums: proof of concept. *Paper for the New Review of Hypermedia and Multimedia* (draft version 2006).

Trant, Jennifer, David Bearman & Susan Chun. 2007. The eye of the beholder: steve.museum and social tagging of museum collections. Paper presented at the *International Cultural Heritage Informatics Meeting (ICHIM07)*. Proceedings CD-ROM, Jennifer Trant & David Bearman (eds). Toronto: Archives & Museum Informatics 2007. URL: <http://www.archimuse.com/ichim07/papers/trant/trant.html>.

Trant, Jennifer & Bruce Wijman. 2006. Investigating social tagging and folksonomy in the art museum with steve.museum. *A paper for the Tagging Workshop at WWW2006*, Edinburgh, 21 May 2006.

Van Setten, Mark, Rogier Brussee, Harry van Vliet, Luit Gazendam, Ynze van Houten & Mettina Veenstra. 2006. 'On the importance of Who Tagged What'. Paper presented at the *Workshop on the Social Navigation and Community-Based Adaptation Technologies*, in conjunction with Adaptive Hypermedia and Adaptive Web-Based Systems (AH'06), 20 June 2006, Dublin, Ireland.

Van Vliet, Harry. 2009. *Digital Cabinets of Curiosity. Cultural Heritage & Cross-media* (De Digitale Kunstkamer. Cultureel Erfgoed en Crossmedia). Utrecht: Utrecht University of Applied Sciences (Hogeschool Utrecht). (Cell Cahier #1)

Van Vliet, Harry, Erik Hekman, Niniane Veldhoen & Matthijs Rotte. 2010. *The Public Annotation of Cultural Heritage (Publieksannotatie van Cultureel Erfgoed)*. Research report at the Crossmedialab. Utrecht: Utrecht University of Applied Sciences (Hogeschool Utrecht).

Veeger, L. 2008. *Drawing up the balance of collections. Research into the ups and downs of museum collections in The Netherlands. (De collectiebalans. Een onderzoek naar het wel en wee van museumcollecties in Nederland)*. Amsterdam: The Netherlands Institute for Cultural Heritage (Instituut Collectie Nederland).

Wubs, Henrieke & Frank Huysmans. 2006a. *Digging and sniffing around. On target groups of digitally accessible archives (Snuffelen en graven. Over doelgroepen van digitaal toegankelijke archieven)*. The Hague: Social and Cultural Planning Office (Sociaal en Cultureel Planbureau).