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# WeCurate: Multiuser Museum Interactives for Shared Cultural Experiences

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**Abstract**

WeCurate is a multiuser museum interactive system that allows users to collaboratively create a virtual exhibition from a cultural image archive. WeCurate provides a synchronised image browser across multiple devices to enable a group of users to work together to curate a collection of images, through negotiation and collective decision making. This paper reports on the findings of a five day trial of WeCurate when it was installed at a major London museum. This paper focuses exclusively on the scope and characteristics of the social experience afforded through the collaborative use of the system.

**Author Keywords**

Museum technologies; social negotiation; decision making.

**ACM Classification Keywords**

H.5. [Information interfaces and presentation (e.g., HCI)]: Group and Organization Interfaces, Synchronous interaction.

**Introduction**

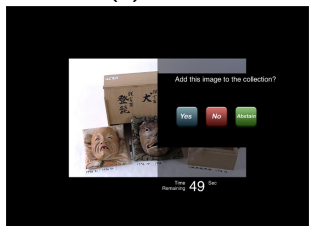
WeCurate is an image browser for collaboratively creating a virtual exhibition from a cultural image archive. WeCurate allows users to synchronously view media and negotiate which images to add to the group's image collection. It provides a platform for sociocultural



(a) The selection scene



(b) The forum scene



(c) The vote scene

**Figure 1:** The WeCurate user interface.

experiences, combining the actions of autonomic agents and users to support decision-making. WeCurate is tasked with enabling communication around the deconstruction and appropriateness of the images of museum artefacts. The role of the autonomic agents is to enable users to focus attention on images judged to hold the interest of the group. The agents' judgement is based on the group's interaction with the image, preferences, and the quantity and editing of tags. This paper reports on the social behaviours observed during the trial; other aspects such as the autonomic agent design and technical implementation, are reported elsewhere[15].

The users interact with the system using an animated user interface which consists of three scenes:

- **Selection scene:** its purpose is to allow a quick decision as to whether an image is interesting enough for a full discussion. Users can *zoom* into the image and see the zooming actions of other users. They can also set their *overall preference* for the image using a simple like/dislike slider, which also shows the preferences of other users in the group. The UI is shown in figure 1a.
- **Forum scene:** if an image is deemed interesting enough by the agents, users are taken to the forum scene where they can engage in a full *discussion* of the image. Users can add, delete, weight tags, and can see the actions of the other users so they have a sense of what others in the group are interested in. They can also view images that were previously added to the collection. The UI is shown in figure 1b.
- **Vote scene:** here, the decision is made to add an

image to the group collection, or not, by *voting*. The UI is shown in figure 1c.

## Related Work

WeCurate focuses on supporting multiuser interaction to reflect the social practice of visiting museums with families, friends and education groups [11, 13]. Sociality enriches the experience as more informed members of the social group can mediate information relating to the exhibits, and peers will attempt to make sense together by drawing on their personal histories [7, 2]. This understanding of social practice is reflected in attention to the development of museum technologies that afford multiuser interaction, which WeCurate builds upon. [4, 5, 6, 12, 14].

It is not just the knowledge and social engagement which makes supporting collaborative behaviours beneficial. As visitors approach museum technologies as a group, if multiuser activity is not accommodated, then the interference from others could disrupt the anticipated interaction [1, 9]. In recognising social groups, the design of the activity and interface needs to consider the potentially unique usage of interactive systems due to the varying dynamics of interpersonal behaviour [4, 12].

To collaborate, users need to share mutual attention, mutual comprehension and interdependent behaviour within shared environments [3]. The representation of individual action and the coordination of the screens in WeCurate aims to generate a sense of shared experience [12]. As Cosely et al [5], WeCurate incorporates tagging images as a shared activity to serve multiple purposes - to navigate, think about cultural objects, and create a sense of social presence. Individually annotating the image provides a route to deconstruction, by identifying salient

properties which are in accord with the understanding of the group [5, 10].

The WeCurate interface displays all of the group's tags as they are created. Representations of social tagging can reflect the sum of the collective understanding of unique groups, which both contributes to social presence and impacts individual decision making [5]. However, publicly tagging museum artefacts is not straightforward. The authoritative voice of the museum's experts can undermine novices' confidence in expressing their opinions and knowledge, and their subsequent reluctance to contribute [10]. To enable users to be less inhibited, the tags created in WeCurate are discarded at the end of each session. Reflections of visitors over time are lost, but this approach is more sensitive to social comfort, as the deconstruction of the image can be shaped exclusively by the group.

## Study

The objective of the evaluation was to determine how WeCurate would be used by the differing social groups among museum visitors. Of particular interest was the communication and discussion about the artefacts/images presented by the system, and whether the coordinated view and task supported an awareness of social action. Our evaluation used a Grounded Theory (GT) approach to code data from multiple sources to build an account of use [8]. As we were unsure about how the system would be used, GT enabled a more speculative and emergent approach to rationalising the findings of this study.

## Method

The WeCurate system was presented as an interactive exhibit in the museum space, and supported by the research team. Up to four visitors used WeCurate running

on 4 iPads, fixed around a single table so the users were co-located. The museum provided 150 images from their collection for the participants to discuss.

## Data collection and analysis

Multiple sources of qualitative and quantitative data were collected:

1. An automatic log of all participants actions (92 sessions)
2. Observations based on field notes (37 sessions<sup>1</sup>)
3. Questionnaires (48 collected)

The analysis of the data concentrated on the distinct interactive behaviours of different social groups. From the observed sessions, direct communication was recorded and cross referenced with the log files to contextualise the users' discussions, while the questionnaire data provided justifications of the participants' behaviour. To determine the dynamics of the shared experience for each group, instances and breakdowns in coordinating and collaborating action were identified and characterised.

## Results

The ages of participants ranged from 4 years (with assistance) to 45 years. Figure 2 shows the types of groups who participated. In addition, the questionnaire showed that 83% of the participants were familiar with the other group members, either friends, family or colleagues, or a combination. The average time each group used the WeCurate system was 5 mins 38 secs, but with a high variation (+/- 4 mins 25 seconds), the longest session logged was 21 mins 16 seconds. Due to the time differences in use, there was also a high variation

<sup>1</sup>Due to the need to support multiple participants it was not possible to record or take full field notes for every session.

Ages of participants

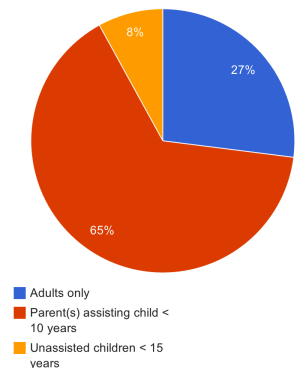


Figure 2: Group types

in the number of images the groups looked at via the system, the average was 4.4 images (+/- 4.1). This section focuses on the behaviours of two key social groups who chose to use the system: parents liaising with children and adult only discussions

*Dynamic between parents and children*

When the parents worked with young children, they almost always shared a device. In these instances, the parent guided the child through the task. The social dynamic between parent and child was dominated by adult initiated action whereby 89% of the parent-child interactions related to the adult driving the child's comprehension and behaviour. Of the adult initiated behaviour, 40% was directing the child's action and attention, and 45% was requesting an opinion about the image from the child. Additional behaviour included encouraging and giving a personal opinion to the child. The adult initiated dialogue included making connections between the image and what the child would see or had seen in the museum. 75% of the participants reported visiting the museum on at least one previous occasion, so many were already familiar with the exhibits, and images of prominent and permanent exhibits were quickly recognised. The child initiated behaviour consisted of the child giving an opinion without a prompt, and requesting interaction when observing parent or peer using the system. There were no observed instances where there was negative social interaction between parent and child when they were engaged in the task (i.e. scolding).

*Dynamic between adults*

Of the recorded data, 54% of social interactions were productive in terms of jointly completing the task, Table 1 shows the characteristics of these interactions. Of the adult only sessions, 70% featured some degree of playful

behaviour, these included reactions to another participant deleting a newly created tag, or commenting on the content of a tag. Consequently for the adults, the creation of a tag, or modifying a group member's tag was often perceived as a playful action. 60% of the adults' sessions also featured an attempt by at least one of the participants to synchronise their actions with the group (i.e. not clicking 'next' until others were ready to move to the next image or onto a vote).

Discussions about particular images tended to consist of short utterances (i.e. "I like this one") rather than a detailed deconstruction of an image's or artefact's qualities. Also, there were instances in 60% of these sessions where a participant expressed an opinion or asked for an opinion and no one responded. The lack of acknowledgement of group members comments could indicate that the participants were too engaged with the task and therefore did not register the comment, or they simply chose to ignore the group member.

*Discussion of task, image and museum artefacts*

The questionnaire showed that 56% reported feeling as if they had a full discussion, while 23% reported that they did not (21% did not comment). While it is encouraging that a majority believed they had a rich debate about the images in the system, as this is a key aspect of the design and use, a more significant margin would be preferable. Of more concern is that in 30% of the sessions observed (with both adults and children) there was no discussion between the participants using separate devices, and in only one of these sessions did the children talk to each other. The absence of discussion could be partially accounted for by the parents preoccupation with supporting their child.

Code	Action%
Agree joint action	4%
Discuss image content	4%
Discuss tag content	12%
Discuss task	4%
Give opinion to group member	8%
Playful behaviour	28%
Request opinion from group member	4%
Synchronise action	28%
Verbal opinion of image content	8%
No response to comment	29%
No verbal discussion	52%
Not synchronising action	19%

**Table 1:** Adults social interaction

### *Social awareness via the system*

When reporting on their ability to express an opinion of the image in the questionnaire, 73% of participants felt they were able to express a preference in the selection scene, and 81% reported that they could express opinions via the forum scene using the tags. This suggests that the participants felt they were able to communicate their preferences via the WeCurate Interface. There was also some positive feedback on the usefulness of seeing other's image preference, where 85% of participants found this feature helpful and 73% reported viewing other's tags as beneficial. Only 13% of participants reported being unaware of others' actions when using the system (shown as tagging, image preference and voting). The social group did appear to have some influence over individual's decision making, whereby 42% reported changing their decision as a consequence of seeing other's actions.

### **Discussion and future work**

There were key patterns in the social use of WeCurate. The most notable group were parent-child, where the adult framed the activity. The use of the system in adult only groups tended to be less structured with less discussion, but more playful. The evaluation demonstrated that the synchronised screens generated a shared awareness, which was evident in the group's influence over individual decision making. However, participants using the system often engaged with its operation, but did not actively discuss the images. Revised designs might consider means of interrupting or provoking the group to encourage a discussion to emerge. Expectations of a detailed deconstruction of the images would be ambitious, particularly given the young age of some of the participants. However, we would like to assist a higher degree of deconstruction and inquiry, with increased opportunities for sharing the experience. Although the

parent-child groups spent a significant proportion of time determining words which would describe the image, only a small number of adults discussed the image's content beyond expressing a brief opinion.

One direction for future development is to build upon the rich parent-child social interaction observed. Either enabling the system to emulate the parent's structuring of the inquiry, or an environment that acknowledges the parents role in mediating the experience. The latter is possibly preferable as it is more inclusive, and is in keeping with the practices of this social group, though the former might encourage groups of children to work independent of adult supervision. If the functionality of WeCurate was able to structure a collective inquiry, this model could be scaled to accommodate the varying intellect and interests of other social groups. We would like to maximise the enjoyment of using the system. For the adults, modifying or extending others contribution appeared to be enacted playfully. The deletion of others' tags suggested that rather than being motivated to build a inclusive representation of the group's opinion, disrupting others may give opportunities for playful behaviour to emerge.

### **Conclusion**

This study evaluated WeCurate, a synchronised image browser designed to enable social groups to engage with cultural artefacts from museum archives. The evaluation considered the dimensions of the social experience, and demonstrated that via the representation of individual opinions and actions, WeCurate was able generate a space for discussion. Clearly further work is needed to shape WeCurate around the dynamics of the varying social practices of museum visitors. This evaluation speculatively suggests that supporting parents' role in framing children's interaction, or strategies to provoke users to

review salient aspects of the cultural artefact, might facilitate meaningful social engagement. Irrespective of the approach, representations of collective knowledge and behaviour are necessary to ensure social presence can emerge in shared environments.

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