

The Interaction of Casual Users with Digital Collections of Visual Art. An Exploratory Study of the WikiArt Website

Lucia Marengo, György Fazekas, and Anastasios Tombros

Queen Mary University of London, London E1 4NS, UK

Abstract. As many cultural institutions are publishing digital heritage material on the web, a new type of user emerged, that casually interacts with the art collection in his/her free time, driven by intrinsic curiosity more than by a professional duty or an informational goal. Can choices in how the interaction with data is structured increase engagement of such users? In our exploratory study, we use the WikiArt project as a case study to analyse how users approach search interfaces for free exploration. Our preliminary results show that, despite the remarkable diversity of artworks available, users rely on familiarity as their main criterion to navigate the website; they stay within known topics and rarely discover new ones. Users show interest in heterogeneous datasets, but their engagement is rarely sustained, while the presence of slightly unrelated artworks in a set can increase curiosity and self-reflection. Finally, we discuss the role of the database's perceived size on users' expectations.

1 Introduction

In the past 20 years, prominent museums have published their collections online, SFMOMA, Musei Vaticani and Rijks Museum, among others. Other projects collate data from smaller institutions and make them available as a single, larger collection, like Europeana, Google Cultural Institute and Wikiart. These projects aim to open, democratise and make cultural heritage more accessible, and have the potential to reach and engage a wide audience of casual users, beyond professionals and scholars, which research on exploratory interfaces mostly concentrated on.

How can we support exploration of casual users with digital collections of artworks? Our research adopts a user-centred approach and analyses the interaction of casual users with existing interfaces to extract how relevant features influence the user experience.

The paper is organised as follows. In the next section, we introduce our theoretical framework that draws from research on information seeking behaviours, and we describe previous studies in the design of exploratory interfaces for casual users. We then illustrate the exploratory study we conducted by observing ten participants freely exploring the Wikiart website [1]. Self-reported data about the experience were collected through an interview and behavioural data were

collected by logging their activity on the website (clicks). We analysed the choices and motivations of the participants following theories in information seeking behaviours.

2 Theoretical framework and related works

Casual users interacting with digital collections are driven by intrinsic motivation in that they voluntarily expose themselves to information. They have no obvious task, information need or specific knowledge gap to bridge. Instead, casual-leisure behaviours can have a wide range of motivating factors, including a desire to change mood or physical state, to kill time, to further personal knowledge, often with no requirement for a specific topic, or to interact socially [6].

Previous studies have discussed the design of interfaces for casual users and have proposed design recommendations. According to Falkowski, the use of a search bar can limit exploration when it dominates the interface. While some search algorithms can isolate users from ideas and opinions different from their own, a phenomenon known as *filter bubble*, browsing gives the user an idea of the breath of contents and expose him/her to all the options, helping the discovery of new perspectives [7]. Walsh and Hall's propose the use of textual summaries of the content to expose the casual users to the overall potential collection. Other suggestions are providing semantic maps of the topics and subtopics, and highlighting contents with high "interestingness" (based on other users' behaviours) [9]. Björneborn introduces dimensions across digital physical and social interfaces to support divergent exploratory behaviours. Examples include, diversity and richness of topics, genres and modalities, use of contrast and imperfections to trigger curiosity, cross contacts between dissimilar areas of the collection, interfaces that invite the user to move, but also to stop and look closer [3].

Following a prototype-based research, Whitelaw developed an interesting framework based on visual representation specifically addressing accessibility of users with casual browsing behaviours [10]: in his *generous interfaces* visual weight is used to show the relative number of artifacts each category contains, or the home page is used to offer a full view of the whole collection.

Finally, Coburn run a design and evaluation study of an experimental interface for the Tyne & Wear online collection [4]. The interface is designed to foster serendipity and it presents the user with a random section of artworks and a dynamic infinite scroll: if the user scrolls frequently and fast the contents s/he encounters will be randomised, if s/he scrolls slowly the contents displayed will keep a close semantic with current ones. Users appreciated the interaction concept, express the need for a search bar for a better navigation control, while sustained immersive behaviours were at times perceived as addictive.

Behavioural psychology, specifically works by Berlyne and Loewenstein [2] [8], provide rich insights into exploratory behaviours and curiosity. Berlyne associated curiosity with the recognition and pursuit of novelty and challenge. Exploratory behaviours are described along two dimensions: on one axis curiosity ranges between *sensory*, seeking for novel sensation and stimuli, and *cognitive*,

seeking for knowledge; on the second axis it ranges between *diversive*, seeking various sources of novelty, and *specific*, seeking in-depth experience with a stimulus. Moreover, behaviours move along both dimensions and curiosity can dry out and revive during a single experience. As described by Loewenstein, curiosity happens when we perceive a gap in our knowledge and, as we seek out to resolve the gap, we engage in exploratory behaviours. The theory proposes that curiosity is more likely to be triggered by information gaps that are significant yet not too big: finding a missing piece is more interesting when we are aware of the greater picture. A small gap is likely to be perceived as not worth any action, while a big one is usually perceived as an impossible goal, the user does avoid exposing him/herself to new information and the gap is not resolved.

3 The study

For our first, exploratory study we selected Wikiart as a case study to observe the interaction of casual users. WikiArt is an online visual art encyclopedia. It collects more than 75000 digital reproductions of paintings from around the world and allows users to edit information about the pieces, much like what Wikipedia does. For this reason, some items are carefully annotated and enriched by textual information and others are not. The website was also chosen for the variety of works it displays, from popular masterpieces to works of less known artists, because it focuses on one type of contents only - visual art, and because it has a simple graphics and limited search options. The interface includes a home page that displays random artworks (changed daily), a search bar and a menu with predefined categories to browse. Whenever the user selects a single painting s/he is led to a detail page that also shows all other paintings from the same artist.

We designed two modalities for the user to interact with, free and topic-based exploration - FE and TE. In the free exploration the participant is able to navigate the website without any constraint; in the topic based exploration the participant chooses a topic and explore it using the database. Whilst they could propose a topic of their choice, a list of topics was available for participants to choose from.

3.1 Method

The study was conducted in one of the Labs at Queen Mary University of London. No compensation was offered and participants were thanked with some drinks and snacks. Each subject signed a consent form for the collection and use of the data. The study design follows a mixed-method (similar to [4], [5] and [11]): we collected both quantitative and qualitative data during a one-hour session. At the beginning, participants were given a short introduction to the interface, including the main navigation options, as we were not interested in evaluating Wikiart's learnability nor we wanted the participant to spend time figuring out the navigation structure. The study was divided into two parts:

in each part the participant explored the website using one of the two modalities for ten minutes and then answered a post-experience questionnaire. This included open and closed-ended questions, the former were answered in person and recorded. Table 3.1 shows the basic structure of the interview. The order of the modalities was randomised. At the end of the second part, the participants answered a final questionnaire about demographics, personal skills and past experience with digital collections. To analyse exploratory behaviours we collected all actions of click the participants performed; for each 'click' we saved the object that was clicked on and the time stamp.

Table 1. Examples of questions used during the interview

	BEHAVIOUR	FEEDBACK
main	How did you start? What happened?	What was positive during the experience? What was negative?
follow-up	Why did you select it? Was a painting your favourite?	What would you change?

Participants were recruited via email among students of Queen Mary University of London. Ten people took part in the study individually, 9 of which were females; participants' age ranged between 19 and 47 years old, with 80% being in the 19-27 age group. All participants are students or ex-students in the Humanities Department. 50% were non-British and had other cultural backgrounds (Italy, China, India, Japan). 9 out of 10 indicated they have a medium to high interest in art, and none of them had professional training in the art field, 3 people had self-taught knowledge and 5 people studied art in high school.

3.2 Analysis and results

Answers to the questionnaire have been plotted and analysed in a qualitative way; data collected during the interviews were transcribed and analysed thematically. In most cases data were analysed in a complementary way: interviews helped highlight motivations and emotional responses of the participants, while activity logs and results of the questionnaire gave us a quantitative measure of the reported behaviours and a reality check. The analysis focused on exploratory strategy, what the user was looking for, what the user did as first step of its exploration and on how and why it was attracted to a specific area of the collection (or single item). We are not discussing other aspects, such as how people changed their interest and modality.

On average participants were equally satisfied with the two modalities (3.8/5 FE and 3.4/5 TE). During the interview, all participants but two preferred the free exploration setting - P9: "that is why I preferred free exploration, cause it is kinda, well free".

Familiarity Familiarity guided most participants in their free exploration. P1, P6 and P8 searched straight-away for a specific painting, artist or style they knew well in advance. They used both the search bar (P8 and P1), both the category menu (P6). P1: "I went straight back to that page that I liked from last time [during topic exploration]" P8: "I already had artists in my head that I like, I went straight searching for them. That is how I started". Familiarity was also a way to structure the exploration around a topic - P8: "my topic was, stuff that I like" - or to initially judge the collection and getting to know it - P6: "the first thing I did was I had a look at category which I know well to see what was in it, then I searched for my favourite artist". Participant were often attracted to a specific painting by familiarity, either with personal experiences, backgrounds or tastes - P5 picked the picture of a letter that reminded him/her of a movie s/he recently saw, on another occasion was guided by his/her cultural background - "it is a special Japanese style, is my language, is very special for me". P1 picked an artwork whose title reminded him/her of a character from a book and later selected a painting related to his/her assignment at QMUL. Personal tastes also related to the participants' choices. P9: "it makes me think to when I was younger and I used to really enjoy looking at this kind of paintings". Participants selected familiar topics also while using browsing tools that give them an overview of many other options, like the menu of categories - P5 selected impressionism because "I know the topic a little bit from before".

Attraction to the unknown The home page was a good attractor to novelty: P2, P4, P9 and P10 started by looking at random artworks. P4 and P9 likes the idea of random artworks, while P10 used it to have an overview of the contents of the website. All the participants quickly moved to other, less random modalities, the maximum time spent on random artworks is 1'06". Only one participant returned to use the home page - P2: "I followed the work of that artists, and then I came back to the home page [and picked another random artwork]. That happened once or twice". The interface seems not to support random exploration: when selecting one random artwork WikiArt displays artworks from the same author that have a semantic connection, while this might not match the user's intentions. P9: "it does not let you carry on, the randomness, so I had to go back and pick it again and that is when I started to go to the styles instead". The menu was used to find novelty (P2, P6, P3), though often people chose categories that *ring a bell* in their mind and they were not completely sure about (P9, P6). P9 never selected totally unknown categories, instead s/he picked those s/he had an expectation about, and enjoyed testing whether her/his assumption was correct. The lack of information about what the name of the categories mean sometimes discouraged people from selecting totally unknown options (P9). Finally, visual information gaps also worked as attractors: P2 was intrigued by the thumbnail of a painting that contained text s/he could barely read (because of the size). Attraction to novelty and diversive exploration seemed also related to personal inclination (P2, P3, partly P6) - P3: "[I select one style], but I always go back to see another type, another art movement I never saw before."

Heterogeneity In many occasions, participants noticed artworks that were slightly different from those they were grouped with and followed this serendipitous encounter. P1 was looking at paintings of people reading books but picked the only one where the subject was looking straight at the painter - P1: "she is not even holding a book, so I do not know why it was in *reading*, I just thought that face was interesting". Unrelated painting helped to independently learn about unknown themes: P1 compared paintings from the 18th century to less recent ones that also appeared in the results, and was able to talk about how the depicted subjects changed over time. P5 was able to compare the artist skills with different techniques as the interface displayed sketches and oil paintings together. An overview of the categories can also help the user to formulate an idea of the overall contents of the website and of the work of a single artist, and can give a sense of clarity and order that is appreciated (P5, P8, P10).

Information and missing information People often mention the experience could have been better if they had more information about the paintings or the categories: information would help to connect and understand an artwork beyond a first, superficial look (P10, P4, P1, P8). Some people, however, did not like written information that was perceived intrusive to their personal experience and interpretation of art (P2, P6, P9). P6 said s/he did not look at any text, for P9 little information about the painting technique could be valuable, but "I wouldn't be too bothered to read reviews about paintings, because when you look at art, it is so, subjective [...] I see what I see, you see what you see". Similarly P2: "you do want some background, but not so much that the explanation takes over the artwork. [...] I think it takes away from the art a little when it requires so much explanation". Incomplete information also triggered imagination: P1 created a story about the girl in the painting after reading a short description of her relationship with the artist.

Size and completeness The huge number of items available was a positive feature (P5, P8, P9) and something that differentiate the website from a physical gallery with limited space (P5). P8 "it is quite impressive [...] they literally have maybe every piece of work that I would want to see". However, the richness of contents seems not balanced across categories, specifically between Western and Asian artist (P3, P10). The website might be perceived as being bigger than it is because its name suggests all known artworks are included (P6). The perceived size can influence the participants' expectations, they can be disappointed if they cannot find a specific artist they were looking for - P6: "I am sure it would be in there, I am sure they aim to put everyone in there". The size of the collection was also inferred from the number of styles in the category menu, and this sometimes led participants into a state of information overload. P9: "it was confusing, I was like wow, gosh that is without an information, like I do not know what any of these means either. 300 styles there were just so many". P10: "after I use [the filter tool] there is still a large collection to see, it is still too much for me."

Engagement We evaluated how participants were engaged and whether their behaviours and feedback were due to active interest or passive browsing. Fig. 1 shows the ratings from 1 to 5 for the engagement-related dimensions of satisfaction, boredom, interest, relaxation, fun, perception of the passing of time and of the physical context. Participants reported the experience to be a positive one, during both modalities (FE and TE), with the dimensions of boredom and non-interest having a low average (1.1 FE/TE, 1.2 FE and 1.1 TE), and fun and relaxing state having high rating (3.8 and 4.1 FE and 3.7 and 4.2 TE). People reported that they would be open to repeating the experience (3.8 FE and 3.7 TE). We found no significant difference comparing the rating for 1st and 2nd activity. The analysis of qualitative interviews highlighted that P10 was nervous because s/he was not given a specific task and did not feel useful to the research and that P6 was nervous because s/he thought the study was meant to evaluate his/her skills using the interface.

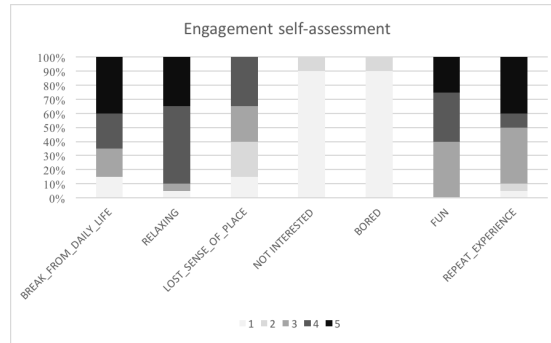


Fig. 1. Self-assessment of engagement-related dimensions

Usability Participants reported on the usability and on any bugs they encountered. All subjects rated the usability with a score of 3 out of 5 or higher and 60% rated it 5. We judged the bugs as non-relevant in the scope of the study.

4 Discussion and conclusion

We presented an exploratory study of casual users' interaction with the search interface of the WikiArt website. Participants' behaviours can be described according to curiosity dimensions proposed by Berlyne: some people seemed to be guided by diversive curiosity, using the category menu and jumping from one item to another, while others focused on few artists or styles (*specific curiosity*). The interface seems to be better suited for the latter group: to engage in diversive exploration users need to "go back" to the menu multiple times, or to open separate tabs, possibly associated with a higher cognitive load. We can also distinguish elements that might support *perceptual curiosity* (grid of thumbnails

used to present search results) from elements that relate to *cognitive curiosity* (textual information and sections with heterogeneous artworks. Insights from the interviews revealed that users used familiarity as a main criteria to navigate the interface and, while serendipitous encounters still happened, people mostly explored areas of the collection they were already somewhat familiar with. These results support the information gap theory, while also suggesting that the current search interface does not encourage extreme curious behaviours, possibly leading to the information bubble phenomenon.

It should be considered that the study was run in a Lab and cannot fully mimic the experience in real context. The session could reflect behaviours during the first interaction with a website, but might not reflect subsequent interactions. Finally, participants were mostly females.

5 Acknowledgments

This research was funded by EPSRC and AHRC Centre for Doctoral Training in Media and Arts Technology (EP/L01632X/1).

References

- [1] Wikiart.org - visual art encyclopedia. [online] <https://www.wikiart.org/>
- [2] Berlyne, D.E.: A theory of human curiosity. *British Journal of Psychology. General Section* 45(3), 180–191 (1954)
- [3] Björneborn, L.: Design dimensions enabling divergent behaviour across physical, digital, and social library interfaces. In: *International Conference on Persuasive Technology*. pp. 143–149. Springer (2010)
- [4] Coburn, J.: I dont know what im looking for: Better understanding public usage and behaviours with tyne & wear archives & museums online collections. *MW2016: Museums and the Web 2016* (2016)
- [5] Dörk, M., Williamson, C., Carpendale, S.: Navigating tomorrow’s web: From searching and browsing to visual exploration. *ACM Transactions on the Web (TWEB)* 6(3), 13 (2012)
- [6] Elsweiler, D., Wilson, M.L., Kirkegaard Lunn, B.: Chapter 9 understanding casual-leisure information behaviour. In: *New directions in information behaviour*, pp. 211–241. Emerald Group Publishing Limited (2011)
- [7] Falkowski, J.: Custom collections content and generous interfaces. *MW2016: Museums and the Web 2016* (2016)
- [8] Loewenstein, G.: The psychology of curiosity: A review and reinterpretation. *Psychological bulletin* 116(1), 75 (1994)
- [9] Walsh, D., Hall, M.M.: Just looking around: Supporting casual users initial encounters with digital cultural heritage (2015)
- [10] Whitelaw, M.: Generous interfaces for digital cultural collections. *Digital Humanities Quarterly* 9(1), 38 (2015)
- [11] Zhang, J., Marchionini, G.: Evaluation and evolution of a browse and search interface: Relation browser++. In: *Proceedings of the 2005 national conference on Digital government research*. pp. 179–188. Digital Government Society of North America (2005)