

# From Information Delivery to Interpretation Support: Evaluating Cultural Heritage Access on the Web

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## ABSTRACT

In this paper, we present an evaluation framework for online access to cultural heritage. The framework enables the assessment of online cultural heritage applications in terms of their provision and support of information and interpretation. It is anchored in digital hermeneutics: the study and theory of the Web as a vehicle of (self)-interpretation. Digital hermeneutics considers the limits of automation and modelling on the one hand, and the interaction of people and technology on the other. In this paper, this philosophical issue will linger in the background, while we focus on the more practical issues of (1) explaining the evaluation framework and (2) describing our work in Agora in the context of that framework. We analyze twelve Web applications, representing the range of current state of the art in this field. This provides valuable insights into what cultural heritage applications on the Web do, can do, and how distinctive goals are to be achieved. Then we report on three user studies with the Agora demonstrator which made us reconsider a number of assumptions we made about the user's needs for information and interpretation.

## ACM Classification Keywords

H.1.2 User/Machine Systems: Human Information Processing

## Author Keywords

Digital Hermeneutics, online cultural heritage, evaluation, Agora, events

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CHI'13, April 27–May 2, 2013, Paris, France.

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## INTRODUCTION

The definite mark of the 21st century can be described by two phenomena: a big chunk of the world's information can be found online, and a big part of it is also contributed not only by distinguished scholars but by the regular people spread around the boundless realm of the Internet. As part of this trend, many museums, libraries and cultural heritage archives are enthusiastic about the opportunities that offering their collections online provide [4, 6, 8]. However, at the same time, most of them are struggling to provide appropriate support to their online visitors in accessing their collections (professional domain experts as well as people from the general audience).

The main problem institutions are facing is that users (often without much background knowledge) are left on their own to browse and search through massive online portals without the typical guidance of the carefully curated museum exhibitions. Millions of objects are only supported by brief (manually added) historical context, short descriptions or some limited metadata information [9]. Crucial for preventing their users of getting lost, cultural heritage institutions are challenged to satisfy the user's desire for information and interpretation. However, it is still unclear how online collections could support the information need of their users and the process of interpreting digital objects.

An additional burden comes from the fact that some of the cultural heritage institutions (libraries, archives, and museums) are typically trained to serve professionals and domain experts, and not specialised in providing the necessary context for their objects in a form suitable to a wider audience. As a result, cultural heritage collections lose their potential appeal or remain undiscovered by a large amount of the users from the general public.

To connect to the public and keep people engaged, museums often create online exhibitions or interactive applications presenting only a small part of their collection. Typically, the size of the collections, as well as the fact that objects can be paired in many different ways prevents museums from doing this for their entire collection. The ultimate hypothesis of our research is that cultural heritage institutions need to find the right balance between (1) providing information and supporting access to this information, and (2) providing and supporting its interpretation in ways suitable for a diverse range of online visitors.

In this paper, we present two contributions:

- We propose a framework, anchored in what we call *digital hermeneutics*, that brings together various perspectives of the construction, provision and support of information and its interpretation.
- We use this framework to analyse and evaluate Web applications offering online access to cultural heritage.

Furthermore, we discuss how we evaluate and extend the Agora project<sup>1</sup> in relation to this framework. The Agora project is an interdisciplinary project of the History and Computer Science departments at VU University Amsterdam where the distinction between information and interpretation is central. The remainder of this paper is organised as follows. We first explain our reasons for making this distinction and its relevance. Then we present our framework is presented, followed by its instantiation with twelve representative Web applications offering access to cultural heritage. We then describe three user studies performed in the Agora project along the dimensions of our framework. We end with the conclusions we draw from the user feedback and future work.

## DIGITAL HERMENEUTICS

The distinction between *information* and *interpretation* is often more or less explicitly made in the context of applications in the cultural heritage domain. On the one hand, cultural heritage institutions provide access to (parts of) the information system consisting of object descriptions and images of objects (if there are any). On the other hand, they want to actively engage visitors and support them and their curators in the interpretation process. Two things follow from the distinction between information and interpretation.

First, the terms stand for two conceptions of what the Web is: is the Web a storehouse of data or is it a means of engaging with the world? The distinction between information and interpretation obliges us to think about the limits of automation. Automating everything would leave no room for interaction between humans and technology. If the Web is a means to engage with the world, then it is about interpretation, leaving a good deal of what happens in the hands of human agents. It follows that, if that is true, we have to acknowledge the inherent

“vagueness” [1, 7] of the things we want to model, leaving room for interpretation. Hence, the role of *events* is important in human communication. Our understanding of the world is transferred to others through events and stories, in which objects and abstract notions are grounded in space and time through their participation in events. However, it is important to acknowledge that an important part of understanding of events is observing various perspectives and points of views.

Second, the distinction between information and interpretation helps us to think about the needs and demands of different user groups, for an expert may at one moment use an application as a reference work, counting on the trustworthiness of the provided information, whilst a lay user of the same application may want the freedom to do whatever she likes with what is offered.

These are theoretical points about Web science. They also have practical consequences for the design and evaluation of Web applications providing access to cultural heritage. Both can be approached from the point of view of digital hermeneutics.

Digital hermeneutics is the study of interpretation involving information and communication technology. It is not only concerned with the “foundations of digital technology and its interplay with human existence” [2]; it also deals with the study and theory of the design and evaluation of Web applications as a means of interpretation. This paper, in which we propose a framework for evaluating access to cultural heritage on the Web and present our Agora project in the context of that framework, is concerned with the latter. As we explained in previous work [10], in Agora, object-descriptions are enriched by associated events, providing a first layer of interpretation to those objects. Browsing through a collection with the help of associated events enables the (semi-)automatic generation of event-based narratives as a backbone for story lines that help users interpret and understand the meaning of the objects in collections.

## COLLECTION UNDERSTANDING FRAMEWORK

In this section, we lay out our framework for analysing and evaluating Web applications for accessing online cultural heritage.

The distinction between *information* and *interpretation* is central to our framework for evaluating access to cultural heritage on the Web. A collection of objects oftentimes provides factual information about an object: for example about its creator, time of creation, and the material out of which it is made. Although the information may provide a cultural or historical context of the object, it alone does not enable the user to interpret the object’s cultural and historical significance. As cultural heritage institutions want to involve users in the interpretation process and discuss the meaning of their collections, they need to move beyond the traditional provider-driven paradigm where the institution decides what to offer the user. The object’s cultural and his-

<sup>1</sup><http://agora.cs.vu.nl>

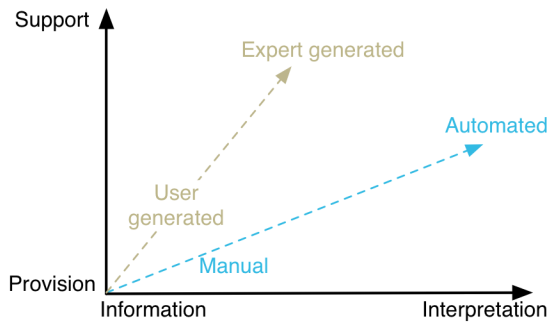


Figure 1. Dimensions of framework for evaluating online access to cultural heritage based on digital hermeneutics

torical significance is determined by its relation to other objects, events, and its place in an overarching story. Cultural heritage institutions may provide such relations themselves or support users in creating or sharing their stories.

The manner in which a collection is accessed can aid or hinder the user in her interpretation process. In traditional search presentations, the user can only find things if she knows what she is looking for. Browsing- or exploration-focused presentations provide the user with options to consider different search paths through the collection. Additionally, it provides the content provider with a means to guide the user through the collection on a more coherent path, possibly aiding interpretation.

Information can be *provided* by a heritage institution or an application can *support* the user in finding information. Similarly, interpretations can be provided by heritage institutions or their application can support these interpretations. The first two axes of our four-dimensional framework therefore consist of the axis representing the spectrum from information to interpretation and the axis representing the spectrum from providing to supporting. We furthermore distinguish between *manually* and *automatically* generated information and interpretation and *user-oriented* and *expert-oriented* applications. The dimensions of our framework are shown in Figure 1.

Wikipedia is prototypical for providing factual information. Search and browse techniques are typical examples of supporting information finding. Presenting a story about one or more objects, for example in an online exhibition or simply as a text, is prototypical of providing an interpretation, whereas an application suggesting plot-relations [3, 12] or narrative relations [11] is prototypical of what we mean by supporting interpretation. In Figure 2, we show how these concepts relate to the dimensions of our framework.

Engaging users in the curation process may lead to new insights, both for users who can thus share their experiences and/or knowledge and for the institutions who may benefit from the knowledge their users have shared with them. Automating part of the interpretation pro-



Figure 2. Framework for evaluating online access to cultural heritage: from information provision to interpretation support



Figure 3. Framework for evaluating online access to cultural heritage: from manual information provision to automatic interpretation Support

cess may also be beneficial to the museum, so they can curate exhibitions (online and offline) more efficiently for the end-users.

As said, we furthermore distinguish between *manually* and *automatically* generated information and interpretation and *user-oriented* and *expert-oriented* applications. An institutional wiki may be in full control of its expert staff, manually adding and updating object descriptions in their information system which may in part be accessible by the public. On the other end of the spectrum, we find systems that suggest to the users possible narratives, generated from their navigation history, or suggested plot-lines for interpreting objects.

Information and interpretation can both be provided and supported manually and automatically. Text extraction techniques, for example, automatically *provide* information whereas search and browse techniques automatically *support* information finding. Writing a story in an online environment manually adds an interpretation, whereas interpretations are automated when relations between objects and/or events are generated automatically.

In Figure 3, we show the dimension from “manually” to “automatically” in our framework from in Figure 2. The terms in blue concern “information” whereas the terms in tan concern “interpretation”. Some applications are by their nature user-oriented, others are expert-oriented.

## INFORMATION VS. INTERPRETATION CH LANDSCAPE

In this section, we provide concrete instances of our framework. We focus on what we take to be defining characteristics of the applications, as most of the time, cultural heritage application aim at several aspects. It is not our goal to provide an extensive list of cultural her-

itage applications, or to discuss their detailed descriptions. The point is to show that our framework enables the assessment of online cultural heritage applications in a way that makes their differences and similarities apparent.

In Figure 4, we show how the set of cultural heritage applications that we chose is situated in our framework. As can be seen, several applications are mentioned twice or more. The reason is that they have more than one central aim.

**Historypin**<sup>2</sup> provides information in the form of a world map with uploaded historical photos from its users. One can also **explore** the place where one lives by entering a location in a **search** box. It also offers collections of photos with descriptions centered around a particular topic or theme (e.g. 1906 San Francisco earthquake). Next to these **user** and **expert created exhibitions**, History Pin offers, what they call, tours of related content “telling a story, exploring a place or walking through time”. Both general users and experts may create tours. Similarly, **Maritiem Digitaal**<sup>3</sup>, an online search system of collections of European maritime museums, too offers a **search box** through which users can explore the collection. When an item is explored, **related items** are shown (usually from within the same category), proving an interpretation of the object. The site also invites **users** to **comment** or **provide meta-data** to the objects in the collection.

**Object Stories**<sup>4</sup> is an education initiative of the Portland Art Museum and Fashionbuddha that moves further in direction of interpretation provision. **Users** are invited into the museum to share a story about the object they favour. These stories are recorded following a series of questions in several categories (discovery, meaning, value, reward, conclusion, description). The **recorded stories**, over 800, arranged in many categories (e.g. hope, adventure) and accompanied by a picture of the storyteller, can be listened to on their Website.

Another example is **7scenes**<sup>5</sup>, a **storytelling platform** that **helps users link** media objects to places to create city experiences tailored to different people. This mobile phone application uses interactive templates as well as game like elements to keep users entertained. It furthermore provides statistics of the experiences as an additional reflection point. Where **Object Stories** provides interpretations (stories), **7scenes** aims to support users in making their interpretations of objects and places.

The model most commonly used by cultural heritage institutions is a combination of supporting access to a collections by means of a facilitating searching and browsing and providing manually curated exhibitions of their collections. This is the model used by the **Europeana**

portal<sup>6</sup>. Also the **Amsterdam Museum** features a manually curated exhibition, Amsterdam DNA<sup>7</sup>, which users can **browse** through, providing the museum’s interpretation of a selection of objects in their collection. Similarly, the **BBC history of the world in 100 objects**<sup>8</sup>, is on the one hand a series of radio programmes by the director of the British Museum, providing expert interpretations, while on the other hand it consists of a Web site supporting information finding by means of browsing through objects along a timeline.

Although some applications mainly aim at supporting information finding (the **New York Public Library’s Biblion**<sup>9</sup>, for instance, confines itself to taking full advantage of the iPad’s touch interface by letting users **browse** through heterogeneous material (e.g. documents, pictures, etc.) represented as library stacks); information finding through search and browse is often supplemented by providing relations to other objects in the collection, usually to objects belonging to one of the same categories the application is using. This can be said to form the starting point of the research projects that are mentioned in the figure.

All research projects, **CultureSampo**<sup>10</sup>, **Paths**<sup>11</sup>, **Decipher**<sup>12</sup>, and **Agora**, are found in the upper right corner of the landscape since they all aim to support the interpretation of objects. To understand the differences between these projects, we should add the dimension manual vs. automated resulting in a placement in our framework as shown in Figure 5. The blue applications provide or support *information*, whereas the tan applications provide or support *interpretations*.

**Culture Sampo** is an extension of an earlier initiative, MuseumFinland, which was the first large scale research project using **semantic web technologies** to provide **links** between heterogeneous cultural objects. The semantics provide additional context and support for the **search and browsing** as well as access at different levels of semantic granularity. **Users** can furthermore organise objects in different contexts, creating different **perspectives** (interpretations) on Finnish cultural heritage. **Decipher** aims at supporting the **curatorial interpretation** of objects in cultural heritage institutions by means of narrative-relations between objects. Objects can be related by means of **associated facets** (e.g. theme, time, and location) and by means of one of the five distinguished **plot-relations** (e.g. related, influences, motivated, in reaction to, and inspired). Curators can alter the dramatic effect of a narrative by altering the principles for organising its elements, that

<sup>6</sup><http://www.europeana.eu/>, retrieved: 27/01/13

<sup>7</sup><http://www.amsterdammuseum.nl/en/dna/amsterdam-dna>, retrieved: 27/01/13

<sup>8</sup><http://www.bbc.co.uk/ahistoryoftheworld/>, 27/01/13

<sup>9</sup><http://exhibitions.nypl.org/biblion/>, 27/01/13

<sup>10</sup><http://www.kulttuurisampo.fi/?lang=en>, 27/01/13

<sup>11</sup><http://www.paths-project.eu>, retrieved: 27/01/13

<sup>12</sup><http://www.decipher-research.eu/>, retrieved: 27/01/13

<sup>2</sup><http://www.historypin.com/>, retrieved: 27/01/13

<sup>3</sup><http://www.maritiemdigitaal.nl/>, retrieved: 27/01/13

<sup>4</sup><http://www.objectstories.org/>, retrieved: 27/01/13

<sup>5</sup><http://www.7scenes.com>, retrieved: 27/01/13

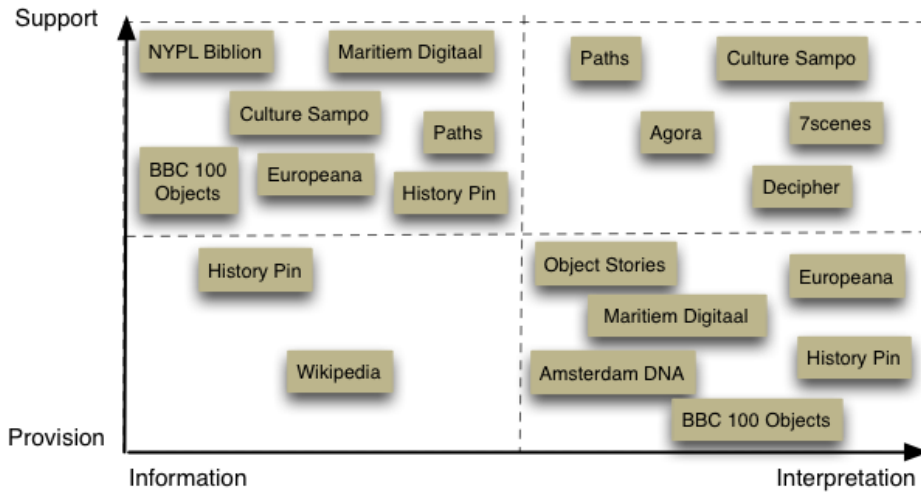


Figure 4. Online cultural heritage access applications situated in the digital hermeneutics evaluation framework according to the level of information and interpretation provision

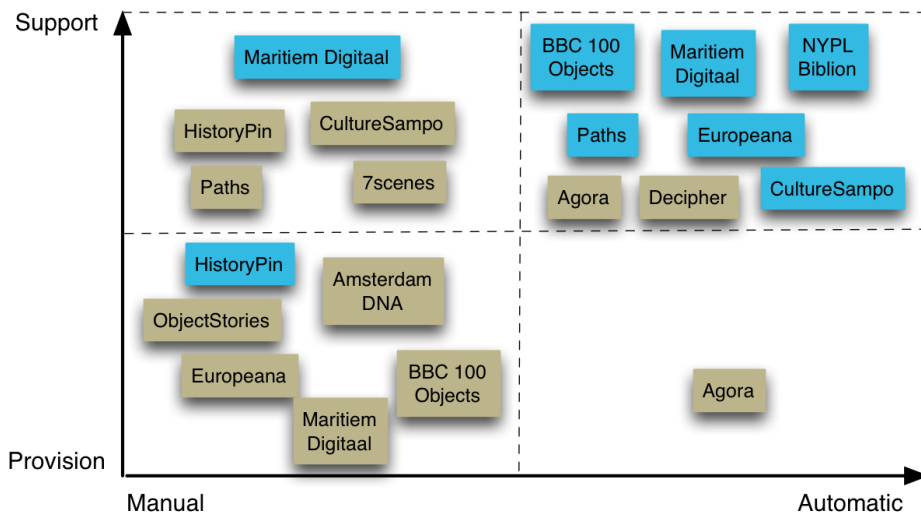


Figure 5. Online cultural heritage applications situated in the digital hermeneutics evaluation framework according to their level of manual or automatic information and interpretation provision

is, in terms of facets, in terms of plot, or a combination of these (i.e. first facet then plot, or first plot and then facet). The **Paths** project aims at supporting users in their interpretation in digital library collections by supporting information finding through **keyword search** and by providing **personalised paths** based around a particular theme. Users can either follow paths through the collection made by others or make a path of their own. These paths are created **manually**. Both **experts** and lay **users** can **create** such paths.

For **Agora** historical events are central for the interpretation of cultural heritage objects. By enriching object metadata with event information (i.e. time, place, actors, and type of event), **users** are able to **browse** through the collection in such a way that the historical context of the objects is provided for. Their navigation path allows further interpretation with the help of

suggestion it offers for possible **narrative relations** between the events. Users are given the option to choose instances from three prototypical narratives (i.e. topical, biographical, or topological). These proto-narratives are **automatically** generated from user's browsing behaviour and presented as possible choices for interpretation to the user. Therefore these interpretations are in part provided, and in part supportive of the user's interpretation. Users can refine their interpretation by ordering the events in their chosen proto-narrative on the basis of the event-properties of those events (i.e. actor, location, time, or type) [10].

Comparing both figures and their instances allows for describing the differences and similarities between applications for the online access of cultural heritage. There is an overall spectrum from experts providing manually information to applications automatically supporting in-

terpretations. Within this range, in which all applications can be situated, differences and similarities between applications become apparent. This strengthens our hypothesis that the distinction between information and interpretation is central to the design and evaluating of access to online cultural heritage. The user studies we have conducted further support this hypothesis.

### AGORA USER STUDIES

In this section, we explain how the distinction between information and interpretation is deployed in the Agora demonstrator. We do so by reporting on three user studies through which we validate the application of the digital hermeneutics framework. The feedback we received from the users furthermore provides us with new insights for deployment of the framework in the Agora browser.

Within the Agora project, we are aiming at **maximising the interpretation support** in a **user-driven** fashion. We do this by providing users with museum object metadata enriched with events. Our hypothesis is that enriching a cultural heritage collection with event information helps the interpretation process, for it grounds objects into their historical context. However, we wish to take this yet another step further, because as explained in [10], events on their own are not enough to provide meaning to a collection. Therefore, we have also investigated the use of **narrative relations between events** to support users in their interpretation process [11].

In the first two user studies, we investigated whether collection enrichment with events and narratives supports users in interpreting objects in the Agora browser. In these two studies, we evaluated collection understanding and interpretation according to the following criteria:

- Are objects and aspects of them correctly identified? (e.g. a painting depicts a Dutch aircraft bombing Yogyakarta, a city on Java).
- Are the correct external objects and event-information identified to enrich the description information of an object? (e.g. a painting of an aircraft bombing is related to external information on Operation Kraai, the code name of The Second Police Action, found on Wikipedia).
- Are objects situated in the correct historical context? (e.g. the bombing was part of *Second Police Action*).
- Does the collection of objects compiled by the student provide an answer to their initially formulated research question?

In the third user study, we interviewed potential data providers from a remembrance community about whether the Agora platform would help them present their experiences in a meaningful manner. In this study, we investigated how an online collection access platform can maximise the *user-driven* information and interpretation process in order to promote **user involvement**.

### User Study 1: Undergraduate History Students

For the first user study, 13 undergraduate history students, participating in the “Cultural sources of Political History” course at VU University Amsterdam, were asked to formulate a research question and answer it with the help of the Agora browser. The students were split up in two groups and both groups were given access to a heritage collection with the theme “Decolonisation”. The object descriptions provided by the Rijksmuseum Amsterdam and the Netherlands Institute for Sound and Vision were enriched with historical events and event properties were made explicit if necessary (e.g. if actor is only mentioned in the textual description and not in the structured object description it is explicitly structured). When the information in the demo was not found sufficient, the students could browse the web or consult other sources to complement their selection. One of the groups was also given the option of using the automatically generated proto-narratives, supporting their interpretation of the objects in the demo.

The students wrote up their findings in a research report. In this report, they were to specify what information they extracted from the demo in answering their research question, what information was found elsewhere, and what selection of objects provided the answer to their research question. Afterwards, a session was organised in which the students presented their work and provided feedback on the demo. A survey was also distributed in which the students were asked specifically about the way they used the demo.

All thirteen students were able to correctly identify the objects and aspects thereof and situated them in a correct historical context. Ten of the student reports clearly showed an enrichment of the objects with the help of external information. Their personal selection of objects provided an answer to their research question in all cases. As such, this study confirmed our hypothesis that the Agora demonstrator helps the interpretation of museum collections through event-centred browsing.

From the group of six students in the test-group using the automatically generated proto-narratives, four students clearly showed that the proto-narratives can be used to integrate objects in an overarching narrative. One student failed to choose from the list of proto-narratives and came up with a narrative of his own, choosing a concept that was not in the browser (e.g. guerilla). One student assumed that the concept “The Hague” referred to a location, whereas it actually indicated the Dutch Government. Thus, the student chose the topological narrative on “The Hague” (instead of the biographical proto-narrative on “The Hague”) and found out that the story he intended to tell did not contain the objects he expected it would. The fact that all students chose to use narratives confirms our hypothesis that narrative structures help users place objects and concepts into context, which is necessary for interpretation. Seven out of thirteen students participated in an

online survey. In overall, they were quite positive about the Agora browser as a means to support their explorations and about the use of event information in answering their research questions. More than half of them also indicated that the pilot encouraged them to use a different approach to search than they normally would. The results from evaluating their reports (summarised in Table 1) show that the events and narratives in the Agora browser helped them gain an understanding of the Rijksmuseum Amsterdam collection. However, the students indicated that there is a need for a chronological structure and background information on the collection objects, to feed their information need and support their interpretation.

### User Study 2: Secondary School Pupils

For the second user study, 44 secondary school pupils between 14 and 16 years old (in groups of two) were given the assignment to report on their understanding and explanation on the topic of “the police actions in the Dutch Indies”. They were to do this by identifying the relevant objects and events in the Rijksmuseum and Sound and Vision collections as well as through other relevant resources online. Contrary to the first user study, the students asked to choose one of two predefined research questions: What was the view of the Dutch Indies population on the police actions? (Dutch Indies perspective); and: What was the view of the Dutch population on the police actions? (Dutch perspective).

The study was performed in two sessions (one class per session) at the Oelbert gymnasium in Oosterhout, the Netherlands. Each session started with a 20-minute introduction of the Agora project including a walkthrough of the Agora browser and followed by a detailed description of the user study assignment. The pupils spent the remaining 70 minutes working on the assignment under the supervision of their history teacher and two Agora team members. The supervisors were instructed to only guide the pupils on to the next step if they got stuck, and to provide explanations for certain browser features if necessary. The pupils recorded their answers in an online form as well as their browse log. For the analysis of the results, both the report and the browse log were anonymised. To measure the level of interpretation, a domain expert - a VU University history researcher and former secondary school history teacher - assessed the answers of pupils on their research question. The evaluation scheme used included four dimensions: (1) objects identified correctly, (2) external information identified correctly, (3) objects situated in historical context correctly and (4) answer to the Research Question found. It appeared that most of the pupils followed a similar routine for answering their questions: First, look up definitions and background information on the subject in online dictionaries and encyclopaedias; then use the demo to find sources; drill down through the list of events to find the “first police action” or “second police action”; and view images and take a look at their description.

Some explicitly stated they had to use an external search engine or encyclopaedia (e.g. Wikipedia) to answer their research question, as they did not get enough information from the Agora browser itself.

The pupils preferred some functionality for browsing more than others. In terms of event browsing, most choose to select top level events, directly related to the theme “Dutch Indies”. Only a few of them also browsed through objects and events related to other events. Each group of pupils viewed on the average 12.68 objects ( $\sigma = 7.247$ ), of which 8.55 ( $\sigma = 6.501$ ) were inspected more carefully by looking at their descriptions. The geographical map, offering an alternative presentation of the list of related objects, was only used twice, with no recorder activity on events and objects on it.

The secondary school pupils had more difficulty in identifying relevant objects and placing these in their historical context. However, one needs to take into account the fact that prior to the user study they were not familiar at all with answering such research questions. Still, the majority of the pupils succeeded in identifying the relevant objects to their research questions. Slightly less than half of the pupils collected the right set of objects to answer their research question. It is important to note here that there appears to be a significant difference (variation) between the research questions to be answered, as 7 out of 11 groups studying the “Dutch Indies perspective on the police actions” found the correct objects to their question, compared to only 3 out of the 11 groups studying the “Dutch perspective on the police actions” who found the correct objects to their question. We believe we can largely attribute this to the lack of background information in the Agora browser at the time of the user studies, given that the undergraduate history students also struggled with the same problem.

The secondary school pupils were less positive about the presented narratives, with 64% of them stating that they would have found the answer to their research question without the narratives too. As they had already viewed the relevant objects during their browsing, they considered the grouping in narratives as an afterthought. The pupils who did respond positively about the narratives said that they appreciated the ordered overview of their objects and events. We believe that the lack of appreciation of the narratives by this large amount of the pupils may be caused by the fact that the narratives the Agora browser are not in the foreground, thus perhaps this form of interpretation support is presented to the user too late. The results of the evaluation of the pupils’ reports are presented in Table 1.

### User Study 3: Remembrance Community

Subsequently, we conducted a 6-person focus group in April 2012, at Indisch Herinneringscentrum Bronbeek<sup>13</sup>, in Arnhem, Netherlands. The session consisted of a short introduction of the Agora project, introductions

<sup>13</sup><http://www.indischherinneringscentrum.nl/>, 27/01/13

Group	Objects identified correctly?	External information correctly?	Information identified	Objects situated in historical context correctly?	Answer to Research Question found?
Undergraduate students (13 individuals)	13 (100%)	10 (77%)		13 (100%)	13 (100%)
Secondary school pupils (22 pairs)	14 (64%)	11 (50%)		9 (41%)	10 (45%)

**Table 1. Number of test subjects (distributed per user study) that met each of the four evaluation criteria**

of the participants and free-form group discussions. The discussions were organized around the following topics: How do you currently share your memories? How would you prefer to preserve and share your memories? How do you participate in the larger remembrance community?

Participants were recruited by the Bronbeek Dutch Indies Remembrance Centre on behalf of VU University Amsterdam. The six participants were evenly distributed in two groups of three men and three women. Five of them had ethnic roots in the Dutch Indies, where the last one was only highly interested in the subject and interacted with members of the second generation Dutch Indies community. The session lasted three hours and was recorded, transcribed and subsequently coded using Dedoose<sup>14</sup>. In this encoding, we could capture whether they already organised their memories around objects, locations, people or events, and/or whether they used narratives and perspectives. We also explored to what extent their community interactions correspond to the four community sense aspects as defined by McMillan & Chavis [5] in order to gain insight on possibly addressing this community through an online platform as extension of the current Agora demonstrator. Lastly, we classified their current memory sharing efforts to provide a structure for presenting such stories in an online platform.

Participants indicate to share their memories of the Dutch Indies frequently, and they do so by presenting narratives. There are different ways employed by this community to share their stories: writing (e.g. books, blogs), art, dance, educational storytelling (with props). The majority of the stories were centered around *people*, thus taking the form of a biographical narrative about themselves or a family member. Some participants actively try to gather stories of others, be it through a foundation in which they participate or out of their own interest. Other stories describe one or more historical events. Typically, these are events participants or their relatives went through themselves.

Objects are most used by participants to reminisce. In half of the instances, these objects *depict historical events* but did not participate in any events, e.g. pictures. In the other half, the stories were formed around *objects that indeed did participate in a historical event*. An example of such an object was a participant’s suitcase that her family used to travel from Indonesia to the Netherlands.

In the examples of stories given by the participants there were only some explicitly stated to be about a *location*. The locations implicitly mentioned in the stories are defined very broad (“Dutch Indies”, “Holland”) or without significance (“harbor”, “our home”). To work in a browsing environment such as the Agora browser, these would have to be disambiguated. Conceptual narratives are rarely used, and if so, they would normally review a particular aspect of daily life in the Dutch Indies.

The participants were aware that their narratives mostly discuss one side of an event, and agree that history should be told from multiple perspectives. Some already try to achieve this by collaborating with other people to tell a particular story. The majority of the participants share their stories in a community and express a feeling that they belong to this community. Some participants actively try to support this community, by establishing a foundation. Others motivate peers to also participate in this community by telling their stories.

#### User Feedback

From the user feedback and analysis of the results of our first two studies we can affirm that presenting objects in their historical context through events and narratives supports the interpretation process. Both the undergraduate history students and secondary school pupils stated they liked the possibility of browsing a collection via events but they were critical of some features of the Agora browser. Currently, events associated with a theme are only presented chronologically through previous and past relations, and for the super- or sub-events the temporal relation has not been made explicit yet. The test subjects indicated that ordering the events chronologically, for example on a timeline, would be a welcome addition.

The browsing interface that was tested contained only the information that was made available directly from the data of the Rijksmuseum collection, enriched automatically with event structures. For a user who is not familiar with a given theme, it would have been helpful to provide information on the objects beyond the basic collection description, such as biographies of people, locations involved or depicted in an object or event; background information and description of the event itself; possibly stories about the event; results and implications from the events. Both the undergraduate history students and secondary school pupils indicated that this would give the objects more context which they deem necessary to understand the significance of the objects.

<sup>14</sup><http://www.dedoose.com/>, retrieved: 27/01/13



This is an indication that Agora could still provide more information to the user.

The proto-narratives generated by the Agora browser, where the objects and events that the users viewed were put in a narrative structure, took some getting used to both for the students and the pupils. This may be due to the fact that they were not in the foreground of the Agora browser, but rather hidden behind a button. The fact that the remembrance community largely structures their memories in biographical and conceptual narrative structures, leads us to believe that including narratives to support interpretation is a useful feature. However, in the version of the Agora browser that we tested with the pupils, the way the narratives were implemented was found suboptimal.

Lastly, most of the secondary school students intuitively grasped the different perspectives presented by different objects in the Agora browser. However, pupils studying the “Dutch Indies perspective on the police actions” scored better than those studying the Dutch perspective, but making this more explicit could support users even more in their interpretation process.

### Limitations

The presented results of the user studies are still limited in size, thus it is too early to draw general conclusions about the exact usefulness of narratives in online collection access applications. The user groups were deliberately kept small, in order to have in-depth discussions with the users and give them the opportunity to provide detailed feedback. From this feedback and the fact that the users represent a wide variety of user groups, we learnt that all user groups implicitly were already using narratives to structure their interpretation. This leads us to believe that event- and narrative-driven browsing are useful structures to explore.

As mentioned by both the undergraduate students and secondary school pupils, the Agora browser interface was not ideal. Firstly, the browser was not tested or optimised for all Internet browsers, and some parts of the interface were not immediately clear to all users. However, the main issue the users in the first two studies mentioned is that they felt the object and event information provided by the Agora browser was too limited. In the next section, we will elaborate on how we are working to improve this.

### CONCLUSIONS AND FUTURE WORK

We are currently in the process of incorporating the main recommendations from our user studies into the Agora browser in order to more effectively support the information and interpretation needs of a diverse community of art-history and history scholars, various cultural heritage experts and interested lay people. One important aspect, that we have already integrated in the demonstrator, are links to relevant Wikipedia articles, as well as using Wikipedia info-boxes to extend Rijksmuseum metadata descriptions when missing in the collection annotation

itself. An example of this is presented in Figure . Additionally, alignment of the Rijksmuseum person thesaurus with the person thesaurus of the Dutch biography portal<sup>15</sup> will be added. This would allow for enrichment of the Rijksmuseum data with biographies. Strengthening information provision this way makes it possible to have the Agora browser function as a reference work for experts and interested lay persons. It would further support more contextually rich interpretations because the content of the generated narratives is richer.

Furthermore, we are re-evaluating the browsing functionalities and splitting up the browsing environment in more separate views. In the browsing interface we tested with the users, we employed different layers of information boxes that could be stacked up. In the new version, we are taking a more traditional approach in which users click through to new pages more, but are presented with clearer navigation and better structured pages. We furthermore clearly distinguish between the part supporting information part and the part supporting interpretation.

To validate the results of the current user studies and to further expand our notion on how to support the understanding of online museum collections, we are preparing a second use case focusing on the access of objects such as ship models, decorations, documents, ship attributes, and paintings related to the battle of Shimonoseki (1863-1864). In this use case, we will scale up our user group by targeting a large online community of interested and knowledgeable laypersons in the maritime history domain. Enriching objects with event-information (i.e. event-name with the associated event-properties actors, time, location, and type) will provide the point of departure for information finding and function as the first layer of the object’s interpretation.

We envisioned two dimensions to order events and hence support interpretation. Currently, only the first dimension, the proto-narratives, has been implemented. The second dimension, ordering the events in the proto-narratives based on the event-properties, still awaits implementation.

Further work on conceptualisation of the digital hermeneutics framework, both as validation of the framework and as linking to other projects, such as Decipher, will be done. Finally, an overall makeover of the browser is planned to bring it closer to the notion of a cultural heritage community object portal that triggers both information needs and interpretation curiosity.

### Acknowledgements

We would like to thank the instructors and students of “Cultural sources of Political History”, teachers and pupils from Oelbert Gymnasium and staff and remembrance community at Museum Bronbeek for participating in our user studies and providing valuable feedback. The Agora project is funded by NWO CATCH programme, grant 640.004.801.

<sup>15</sup><http://www.biografischportaal.nl/> retrieved: 27/01/13

## Hatta, Mohammadi (Person)

Hatta stond aan het hoofd van de Republikeinse delegatie op de Ronde Tafel Conferentie (1949). Op 27 december 1949 tekende hij te Amsterdam namens zijn regering de akte van soevereiniteitsoverdracht. Daarop werd hij minister-president van de Verenigde Staten van Indonesië. Bij de omzetting van deze federatie in een eenheidsstaat (17-08-1950) werd Hatta als premier opgevolgd door Mohammad Natsir. Zelf werd hij op 14-10-1950 vice-president.

Links:

DBpedia Page:[http://dbpedia.org/resource/Mohammad\\_Hatta](http://dbpedia.org/resource/Mohammad_Hatta)

Wikipedia en:[http://en.wikipedia.org/wiki/Mohammad\\_Hatta](http://en.wikipedia.org/wiki/Mohammad_Hatta)

Wikipedia nl:[http://nl.wikipedia.org/wiki/Mohammed\\_Hatta](http://nl.wikipedia.org/wiki/Mohammed_Hatta)

### In Events

Actor in Event

[Ronde Tafel Conferentie](#)

[Tweede politieke actie](#)


### In Collection

Hatta, Mohammad occurs in 5 objects as subject.

Associated Objects (5)

< prev 1 2 next >



Hatta, Mohammad	
	
active	rma_people.tt28
birth date	1902-08-12
birth place	<a href="#">Bukittingi</a>
death place	<a href="#">Jakarta</a>
death date	1980-03-14
gender	male
nationality	Indonesisch
occupation	Minister van Defensie vice-president premier
preferred name	Hatta, Mohammad

### In Narratives

As Topic of Narrative

[Narrative of "Hatta, Mohammad"](#): 3 events, 5 objects

Figure 6. Screenshot of the new Agora browser with external information sources added

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