Memory Fields – a DJ in the Library

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Abstract

A Disc Jockey's (DJ's) model of information interaction is valuable for creative engagement with digital collections of all kinds. Selecting and mixing are fundamental creative behaviours. This paper presents an artwork derived from the DJ's model, which is a dual screen interface used to access a public library's digital collections.

Keywords

DJ, library, collections, creativity, community, story-telling, mixing, selecting, interaction, model.

A Model of Interaction

In recent years institutions have used considerable resources to digitize collections. A current challenge is to facilitate both access and use of electronic archives.

DJs have a longer experience than most of working with large media collections. DJ collections grew dramatically in size following the start of mp3 file-sharing in the early 90's. Their interaction includes collecting, classifying, learning, creative development, and presentation/publication of sets [Figure 1]. The model of information interaction is unusual, in that it includes retrieval and use of media files. The creative input consists of re-used media.

The DJ builds records into sets by mixing one record with another, and the sets are presented live in front of an audience who leave, approve, or ignore. Feedback is direct. DJing is:

> "Generative/evaluative/and a social phenomenon" [1]

The DJ has two basic interface requirements: the collection, and the player. Integral to the collection is a menu system. The player can play at least two media files simultaneously. Together these facilitate the two fundamental information behaviours: *selecting* and *mixing.* These allow personal expression with material authored by someone else. With these behaviours alone the DJ is able to build sequences of information relevant to an environment.

Artwork: 'Camp de Mèmoria'

Interaction models are useful for applying activities to alternative environments. The artwork *Camp de Mèmoria* [Figure 2] is a touch screen interface used to mix two digital collections, viewed and heard through a video wall in the Library of Sant Cugat in Barcelona. The first collection is of Spanish Civil War posters, and the second is a collection of audio field recordings from contemporary Catalonia.

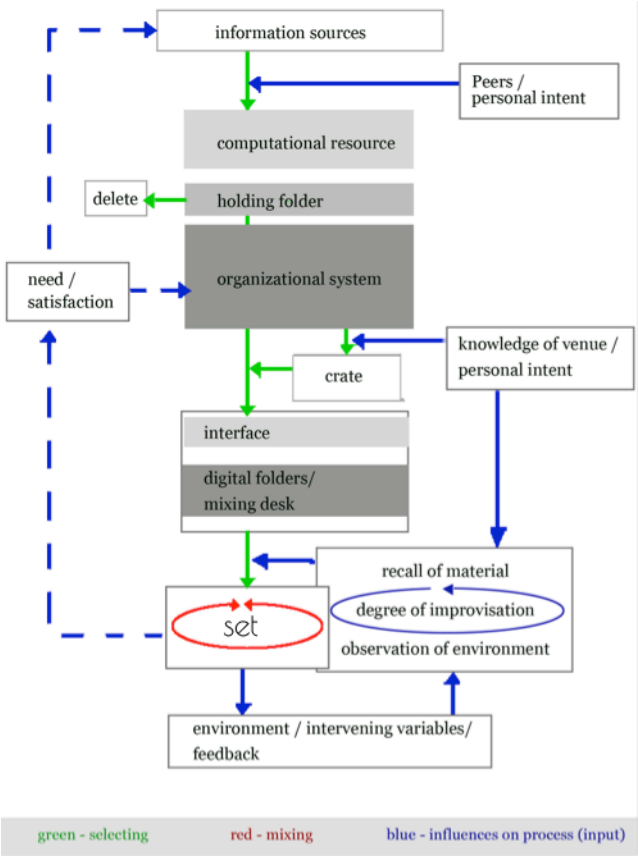

Figure 1. The DJ's Model of Information Interaction

The artwork allows users to explore multiple combinations of the material, to build sequences of image and sound by selecting and mixing. Users can annotate their mixes by adding text to the combinations they create. The artwork promotes social exchange, story-telling, and public engagement with digital collections. Users add memories, stories, and responses to each others mixes. The archive is *revalued* as original material is added in response, or via its

content.

Figure 2. Screen Shot of *Camp de Mèmoria*

A new text connects hitherto unrelated items across the collections in the library.

A touch screen system allows users to adjust sound and image balance (alpha and volume controls). Sequences of material can create narratives and provide alternate contexts for each file in the collections.

When sound and image are selected together the system builds a graphic visualization from the poster image and links this to the volume of each channel of sound (there are two). This aids a viewer to interact with sound levels, and to explore balance between images and sound files. In this way the user can discover, and create in the library collections of Spanish Civil War posters and field recordings of contemporary Catalonia.

Text comments can be added and each appears as a new pop-up menu in the *Camp de Mèmoria* [Figure 3]. Each menu recalls a user's visit, their mixes, comments, and additional responses from new users.

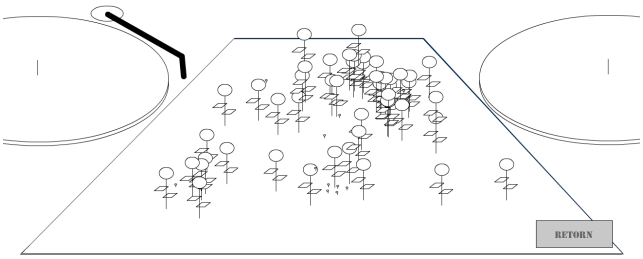

Figure 3. Menu system of annotations in Camp de Mèmoria

Collections and Sound

> "The significance of the "information explosion" […] may lie not in an explosion of quantity *per se*, but in an incalculably greater combinatorial explosion of unnoticed and unintended logical connections." [2]

Information systems that are capable of combining and sequencing stored information can be used to generate new knowledge. This knowledge is derived in a mechanical fashion by combining texts. Media is brought together and linked with semantics. It is mixed [Figure 4].

Interaction with information has been described as if it was a sonic phenomenon:

> "Stripped of any structure, without any predetermined and sequential paths, reading becomes a flowing together with the other elements of the flow, creating temporary (even ephemeral and extemporary, if you like) relationships and configurations." [3]

Figure 4. New Text by Selecting and Mixing

The properties of information are akin to sound, and an understanding of sound interaction is useful to equip us with methods for interacting in information which is immersive.

> "Sight isolates, whereas sound incorporates; vision is directional, whereas sound is omni-directional." [4]

The DJ provides a system for engaging with information, derived from sound interaction. The DJ's engagement is read/write. It necessitates learning and creative development. It includes collecting, ordering, publication, and performance; social exchange with feedback. The DJ responds to a crowd using stored information.

User Interaction

Camp de Mèmoria is tool for creative investigation, which combines creative invention. It allows users to save and comment their searches and choices in a public digital collections. The collection then serves as a communal point of exchange.

Interaction is simple in *Camp de Mèmoria*. The user can choose from two library collections; Civil War posters, and Contemporary Sounds of Catalonia. Up to two posters and two sounds can be displayed simultaneously.

Volumes and mixer controls can be used to alter sound volume and image opacity. Annotations can be added to combinations of media in user sessions.

What is Not Enabled (next level)

A DJ alters the menu system frequently. This is not enabled in *Camp de Mèmoria*. Interaction remains at the level of observation, examination, selecting and mixing with annotating. Interaction at the level of display and communcation through the collections is allowed, but levels of research leading to reclassification and deletion are not made available. A tool that allowed this would be a personal tool for art research (creative interaction and development of information). It would allow more profound research in collections by reordering, relabelling, connecting groups, allow annotated (mixed) sequences of media to be published, and allow findings to be presented directly, and in response to feedback: a tool for investigation, learning, creative development, and exchange.

Technical Description

Early studies for the artwork were developed using ActionScript. These worked with classification, menu systems, and methods for mixing audio and visual media in sequence, and in collage. These studies are published online and have been installed and performed in a variety of galleries and public spaces. See for example *ablab* [5] which combines multiple mini-collections, or *Challenge Yasuní* [6] which classifies video timecode in a menu to disrupt and re-sequence interview narratives.

Camp de Mèmoria uses JavaScript and Python for the interface, and Matlab for the dataset image preprocessing. JavaScript enables the system to have access to countless libraries such as jQuery, Backbone.js, Paper.js, as well as including HTML5 Audio API and Canvas element, among others to, increase interaction design possibilities and widen the field for creativity. The technologies provide the necessary infrastructure to easily work with dynamic datasets and create interactions between dataset elements on the fly. It is possible to scale the system up, to allow the interaction designer access to multiple datasets in a natural way.

Matlab is used in the offline preprocessing step to extract meaningful regions of each dataset image (i.e. image segmentation). Using a colour-based clustering algorithm (K-means), pixels are grouped into three regions and the regions bluish or reddish colours are chosen as the base area for visual effects. After selection, one of several algorithms is applied for generating effects: transforming the pixel colours, applying blurs, introducing noise, detecting object edges, grouping pixels into chunks and drawing boundaries, etc. For each image, one of the effects is chosen and applied in 10 different levels. The resultant images are saved to be used in JavaScript for the responsive visual effects.

One of the main goals of *Camp de Mèmoria* is to promotes public interaction with digital collections. The visual elements were chosen accordingly. Complex designs which may provide a richer experience to an informed user were disregarded, and the system is designed for use by passersby. This requires the elements to "*ask for action*". The established iconography of DJ tools, such as faders and decks facilitate rapid understanding for direct user engagement. Graphic audio visualizations are used to aid user interaction and exploration of connections between material: Spain Civil War posters and contemporary sounds of Catalonia.

Interface design decisions such as choice and placement of interaction elements; -sliders, -decks, and types of allowed interaction took into account the potential reusability of the system for diverse multimodal scenarios. This guarantees that the same interface is suitable for environments using mouse, trackball, touch-screen interaction, multiscreen interaction, or gestural control devices.

Revaluing the Archive

The artwork offers a way to quickly engage with material and to build new compositions from previously unrelated collections. *Camp de Mèmoria* facilitates the emergence of new observations in the collections, in the same way that DJing facilitates new shows, new music, and new genres to emerge from the archive.

Camp de Mèmoria allows users to discover and annotate unintended logical connections which exist across library collections. These can be stored and annotated with user's

texts, memories, stories, and responses. The DJ model applied to the two collections facilitates access, whilst at the same time causing the collections to be *revalued.* New data is generated, information is contributed, new mixes are stored, user selections and interaction patterns are observed. The real community around a public library can begin to exchange stories and memories through engagement in the digital collections.

The specific content of the installation, combined with the process of communal engagement causes the installation to act as a digital memorial:

> "the act of marking a physical or conceptual space for posterity in remembrance of a person or an event, [which] serves as a "bulwark against the terror of forgetting." [7].

Camp de Mèmoria is a platform for social exchange and archive access. Its use of a large video wall to display the posters, abstract visualisations, and sound displays the user engagement publically. Interaction with the touch screen allows access to the annotations by users. The process of public engagement and exchange of stories can have a transformative social effect:

> "Stories build connections between people, provide ways to share knowledge, strengthen civic networks, provide the tools to rebuild communities, and provide the infrastructure, the social capital, which is essential in democratic community-based development." [8]

The artwork will be installed in the Library of Sant Cugat, Barcelona, and in Sonar Festival 2015.

References

1. Robinson, K. 2007. Do schools kill creativity? In: Robinson, K. (ed.) TED Talks. YouTube. http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity#t-181170

2. Swanson, D. R. (1996) *Undiscovered Public Knowledge: a Ten- Year Update.* Data Mining: Integration and Application.

3. Campanelli, V. (2011) *Flowing Together. In: I Read Where I Am: Exploring New Information Cultures* . Breda, Valiz/Graphic Design Museum.

4. Pallasmaa, J. (2007) *The Eyes of the Skin* , Chichester, John Wiley & Sons Ltd.

5. Norton, D. (2012) *ablab*. In Made in Britain. British Council Available at : http://collection.britishcouncil.org/exhibitions/exhibition/made-in-britain-2010 (accessed. 20.05.15 requires Flash Player)

6. Norton, D. Veciana, S. (2014) *Challenge Yasuní*. available at http://alturl.com/w6hgx (accessed 13.10.14 requires Flash Player)

7. Moncur, W. and Kirk, D. (2014) *An Emergent Framework for Digital Memorials* Proceedings of the 2014 conference on Designing interactive systems. P.965-974 ACM New York, USA, quoting Hallam, E. and Hockey, J. (2001) *Death, Memory and Material Culture (Materializing Culture)*

9. Lewis, H. M., (2012) *Living Social Justice in Appalachia,* edited by Patricia D. Beaver and Judith Jennings. Lexington: University Press of KY.

Bibliography

Brewster, B. Broughton, F. (1999) *Last Night a DJ Saved My Life* , New York, Grove Press

Norton, D.A. 2014 *A DJ in the Library*. Leonardo. DOI 10.1162/LEON_a_00915. Available online at http://alturl.com/stzen (accessed 13.10.14)

Norton, D. (2014) *Mixing DJs* – Interactive DJ. Available online at http://ablab.org/pd/int/ (accessed 22.05.15).

Swanson, D. R. (1986) *Undiscovered public knowledge* . Library Quarterly 56 (2), 103-118.

Authors Biographies

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