The open heritage of digital archives. Preservation, sustainability and accessibility of historical documentation to map the field of Italian Mind Science

L. Bollini
Department of Psychology, University of Milano-Bicocca, Milan, Italy

ABSTRACT: In the last few decades many libraries, archives, museum or ephemeral exhibition were transformed in virtual experiences or digital formats due to their own preservation. Nevertheless digitalization is just the first step to preserve knowledge and original documentation to bring them to future generations. The challenge and potentiality of digital archives are to make materials – otherwise destined to wither away or disappear – searchable, accessible, available and durable. The paper is intended to present the Aspi - *Archivio storico della psicologia italiana* (*Historical Archive of Italian Psychology*) as a pilot experience of an open, sustainable and accessible documental centre for researchers, historians, archivists, psychologists, PhD or bachelor students as well as other specialists or public interested in original documents, history and protagonists of Italian psychology. The Aspi – established in 2005 as an interdepartmental centre at the University of Milano-Bicocca and now part of PASt (*Historic Archive Centre*) – is now facing the challenge to become the national on line knowledge-base and reference point of Mind Science documentation. Among the key points of the project are the cross-navigation paths based on the skills and knowledge shared by historians, curators and archivists; the serendipity of discovering associations between the protagonists and further personal or professional relationships; the searchability of manuscript – transcribed or synthesized – and the remote access to date and material not physically stored in the same place.

1 INTRODUCTION

Digitalization is —since a couple of decades— a way to preserve, maintain and spread the cultural heritage to present and next generations. At the same time it becomes an approach to knowledge sharing and preservation both in specialized research field and among a wider public of cultural consumption and mass tourism. Therefor the virtualization of many cultural sources and documentations could become, in the next years, a way to preserve them also from the risk of wear-out and deterioration. The virtual form provides a possible balance between the issues to preserve and study the primary historical sources and a wide accessibility to the knowledge.

On the other hand, digitalization in itself is not enough to enable an *experience* that means a significant cognitive interaction with the *objects*; figures or documents become part of a data- or knowledge-base. Sharing information is the first step in the cultural process, but without the support of contextualization, interpretation and expert explanation doesn't generate a meaningful and deep learning process in itself, on the contrary it is likely to create a split between the value of the *memento* and its real historical significance.

The digitalization process should create, therefore, a balance between the *direct accessibility* to primary documentary sources and the *mediation* guaranteed by the study and interpretation conducted by historians, archivists and other research figures.

According to this perspective on the digitalized cultural heritage, the focus of the process is not the virtual format in itself — crucial and essential for experts— but rather the richness of connections, links and relations that the hyper-textual form can give to physical materials.

2 THE ROLE OF DIGITAL DESIGN IN CULTURAL HERITAGE

Analyzing the many issues that digitalization introduced in the field of historical and cultural heritage we can therefor identify different *layer* and aim.

2.1 *Preservation, sustainability and substitution*

The first level of the digitalization process is represent by an *availability* purpose without compromising the original documents ensuring the conservation and at the same time the visibility to scholars and to the mass public. "A fare notizia è infatti l'acquisizione dei manoscritti e non più la loro digitalizzazione e pubblicazione in rete, che vengono date per scontate. La disponibilità sul web, che prima faceva la differenza, ora è un fattore comune. Il confronto si sposta verso le modalità di fruizione." [The news is the acquisition of manuscripts not their digitalization or upload to the internet, that are taken for granted. The availability on the web, once new, now is a common factor. The difference is in the experience modality] (Bragagnolo, 2016).

The virtual *copy* of the original material becomes therefore the accessible documental source for studies and the future generations. Sometimes just as a *replacement,* other times as the unique survival trace of the past when the historical artifacts are perishable and and their virtual acquisition is the only preservation and survival investigable memory.

This approach is useful in case of fragile materials. One of the first italian projects in this field was held to preserve and to let access the historical textile archives of the Poldi-Pezzoli Museum. Designed by Giovanni Anceschi with Matteo Bologna in 1995-97 in partnership with ITIM-CNR (L'Astorina, s.d.) the *Archivio multimediale dei tessuti* [Multimedia archive of fabric] was an interactive CD-Rom aimed to present good-resolutions images and data sheet about the historical collection owned by the private museum, but no longer displayable due to because of the materials fragility. In this case the digital format represent a good compromise between preservation and accessibility to documentary heritage granting the sustainability of the original sources (Buss, 1998).

Sometimes this approach is a way to overcome other kind of exhibition issues such as the lack of space or the complicity of connections and correlations among materials to by shown and experienced by a *generalist* public. An interesting case study is proposed by the *MOTI Museum of the Image, Breda.100 Years of Dutch Graphic Design.* (Lust, 2008). Interactive tables and digital walls allows people to explore the richness of museum's posters archive, to navigate through their virtual representation and to project onto a wall the chosen element to visualize them in a dynamic, interactive and engaging modality.

As reported by Webster in a interview to Lust Studio designer Barendse: "*Posterwall for the 21st C*entury (2008-12), originally conceived for MOTI, generates posters from metadata sources on the internet. In the most recent edition of this work, which is on tour in the US, Kinect technology enables interaction with visitors as they move through the exhibition space. A fascination with how one experiences the real world and virtual information leads Lust to explore ways to engage us with content via multiple levels of perception and communication. 'We are very interested in how you can add semantic value to the interpretation of data. So not just what it is but also what it might seem'." (Webster, 2013).

The risk of this approach to material preservation is to face the paradox to hand down to posterity virtual copies, images or —better to say— *simulacra* of the original objects without surviving connections with their physical dimension. *Copies without originals* as underlined by Falcinelli (2014) about the production of graphic and visual contents in the digital media scenario, in contrast with the issue raised by Benjamin (1936) of the industrial re-production of unique (art) pieces. The debate about the relationship between the *original* and its *copy,* the *original* and its *digital copy* remains open and increasingly critic if considering the problem of digital obsolescence and the lost of data according to the entropy of information source principle

of the *information theory* (Shannon, 1948). Is a matter of fact that the technological evolution and its discontinuity of format, standard, devices and data support become sometimes disruptive in front of necessary *continuum* in the conservation field. The risk is to came to a paradoxical situation in which data are stored but no longer usable because of a technological gap: something that is already happening with interactive CD-Roms of the '80s, web sites and interactive online applications developed in Flash of the '90 and early '10 or with magnetic storages.

2.2 *Availability and accessibility and nomadism*

One of the advantages brought by digitalization is accessibility of data and information. Furthermore the online environment guarantees a ideally world wide accessibility to knowledge resources and documental archives. In recent years the transition to cloud storage and sharing frameworks have allowed a further evolution so that people can access remotely to digitalized documents and databases.

Although researches are physically preserved in specific places, museums, archives or warehouse, sometimes private or not open to public, once virtually published on the web, the become open and accessible ideally to everyone.

Further more the web allows to collect, cluster and connect materials, contents, multimodal contributions, scattered and divided in more places creating a sort of *virtual* collections overcoming physical boundaries and structural belongings built from conceptual model and significant links.

This is the case of online censuses of homogeneous resources exemplified –among the italian territorial and cultural case studies and best practices— by the *Museoimpresa - Censimento e itinerari dei musei e archivi* [CompanyMuseum - Census and route of museums and archives of Italian Companies/Industries] (2001) a cultural *vortal* aimed to find, map and connect museums and archives of private industries in the national territory to create, share and preserve the knowledge heritage of the productive sector. Or the AIAP [Italian Visual Design Association] *Centro di documentazione. Archivio storico del progetto grafico.* (2009) established by the professional association to preserve and spread the cultural heritage of the italian graphic history by mapping the masterpieces and the individual archives of well-recognized designers.

Building an online database, accessible through a portal or a web site, where documents and resources are digitalized and available is a way to create a traversal virtual *place* to structure,organize and share knowledge breaking down the barriers and limitations of the physical world.

So the great revolution introduced by digital technology is the ability to open up places and archives to collective, massive dimensions, and to the sharing of knowledge itself:

> "Making knowledge coplanar, diachronic and distributed, beyond the four dimensions in a sort of new space-time relativity. The natural evolution of web hypertextual space has allowed the real deconstruction, not only of the physical unit of the archive or museum space, but also and above all, the conceptual space of the collection and its belonging. The works become primordial cells, atoms of culture and of memory, which aggregate, disassociate and recompose in different associations with respect to the static nature of an exhibition, or their belonging to a collection corpus. The objects become nomads and transversal, they intertwine in a continuous movement which stratifies their reading, relations and contaminations. It is the utopic space inside which the same painting, the same work, the same documentary fragment, can simultaneously belong to both a physical place and to multiple virtual places, dialogically recomposing the relationship between the object itself and the analogous, the object itself and the different" (Bollini, 2013).

2.3 *Findability, discoverability and searchbility*

Every time we use a digital resource instead the original analog one, even more when its a document or a written text —if *correctly* acquired— we're able to operate on information due

the typical online conceptual tool such as the *search* strategy. That allows us to directly explore, *manipulate* and *operate* on date using (key) word matching and recurrences to find connection otherwise *opaque* or difficult to find when limited to a *physical* reading.

On one hand, digitalization make information *findable* as conceptualized by Peter Morville, who defines this propriety of the web as "the ability of users to identify an appropriate Web site and navigate the pages of the site to discover and retrieve relevant information resources" (2005). On the other hand the real innovation in front of traditional research in conducted in archives or library or directly on documents is the *searchability* of data, or what Baker calls *discoverability:*

> "*Findability* is similar to, but different from *discoverability*, which is defined as the ability of something, especially a piece of content or information, to be found. It is different from *web search* in that the word 'find' refers to locating something in a known space while 'search' is in an unknown space or not in an expected location" (Baker, 2013).

The digital format introduces a new layer in knowledge exploration typical of the information retrieval strategies to analogical sources according to the multifaceted filtering tools of relational database. This approach allows to find and *see* relations and conceptual connections otherwise implicit but not emerging in the data inquiring. As already noted in a previous research project presented to *WebIST Conference* in 2009 focused on the Historical Dictionary Rosi —about the Italian Unification (CMdC, 2007)—

> "in the framework of a digital version instead the database is *searchable* applying different criteria of selection; criteria can be used singularly or cross correlated to obtain even more specific and precise results (for example date of birth, place of birth, keywords, like the name of a battle or of an event, name of the curator of the biographical note etc.) [take] as an example, the name of a battle can be searched, in order to verify the name of the peoples involved in the event , and at the same time the dead date, in order to exclude peoples that died before the battle or before an event." (Bollini, 2009).

2.4 *Wiki, user participation and generated contents*

If the main goal of museums, libraries and archives is to let people learn about the past and the historical heritage in the many fields of the human cultures and knowledge, virtual formats allows and encourage the direct participations of users to the construction and dissemination of this heritage. Internet, the many wiki-initiatives, the social networks are enabler of participation, sharing and contribution dynamics among people becoming cultural peers themselves.

Even more, user are active participants in building cultural content giving their own free supply, generating contend themselves —the so called *user generated contents*— or *folks*-onomy, sharing notes and annotations, insight or reviews. The approach *read-write* is turning users in authors. If received by a traditional *top-down* organization —Rosati notes about museums— it makes it resilient: "resiliente, migliora l'esperienza di visita consente anzi esperienze plurime, ciascuna ritagliata su misura del singolo. Si innesca così un processo di design permanente, iterativo e partecipato." [improves the visitor experience; allows multiple experiences, each tailored on individual. It triggers permanent design process, iterative and participatory.] (Rosati, 2015) Every tour generates an experience that could become a story in itself, to be recorded and share to next visitors as improved in the new exhibit project of the *Cooper Hewitt Smithsonian Design Museum* due to the adoption of Internet of Things technologies.

Other virtual experiment held by *Open Museum* (2009) and its mobile application *Mobeum* published in 2014.

> "This advanced design experience skips all the paradigms typical of the exhibition project – space, collection, and location – subliming it all in the pure conceptual dimension. An exhibition online space participatory and interactive,

which exists as built from the experience of the users and the social dynamics of participation, word of mouth and viral spread within social networks both virtual and real. The objects displayed belong different e world-wide museums and are reassembled at different times thanks to the story-telling that users build in a bottom-up approach, based on personal associations and values and in terms of shared meanings. The visibility of individual collections themselves is guaranteed and promoted by the activity and social dynamics of so-called healers, or people who, through their participation create and curate the museum exhibitions, gardening them in an evolutionary practice that is enriched by multimodal content both different and integrated contributions, i.e. images, text, audio, video etc." (Bollini & Borsotti, 2014).

The virtual archive, therefor, allows a generative dynamic of *collective intelligence* to paraphrase Derrick De Kerckhove, could be define

"the practice of multiple intelligences in relation to each other in real-time experience of a project […] gives immediately people the experience of their intelligence collectively in their group. And it is pleasant to live because it is a new learning experience, or rather: a old cognitive experience which, however, is awareness accelerating and enriching." (Bollini & Borsotti, 2009).

2.5 *Story telling and serendipity*

The social dynamics of user-generated content and other forms of co-design and direct participation to design practices emphasizes the need of creating a story telling experience that transform data, information and relations among them in a narrative approach shaped on user knowledge and cognitive models.

If expert users —such historians, archivists, scholars specialized in the field— are able, drawing from their background, to identify connections among date, structural patterns of the informations architecture and can complete or *see* meaning relations, *normal* users curious and interested, but not relevant to the subject need some extra cognitive tools to approach the deep complexity of a digital archive by themselves.

Beyond the traditional navigation tools, the virtual experience could be reach and meaningful if part of the expertise are embedded in a narrative exploration of the documents where the story told by editors and curators is able to present and contextualize the single information in a wider and whole picture in which the scenarios and the connections among elements are shown and made explicit. The hyper textual and multimodal potentiality of the digital tools can create and present links and conceptual relations enriching the knowledge acquisition and the data exploration through different contents formats such as texts, images, videos or external contributions.

Besides a *serendipity* approach allows also to expert of the field to discover unconventional associations, weak bonds and unpredictable results that open new unexplored research paths. It can help to verify or falsify a statement or an hypothesis or can support in elaborating new theories.

3 CONTEXT AND RELATIONSHIPS: ASPI A CASE STUDY

Aspi - Archivio storico della psicologia italiana [Historical Archive of Italian Psychology] is a pilot experience of an open, sustainable and accessible documental center for researchers, historians, archivists, psychologists, PhD or bachelor students as well as other specialists or public interested in original documents, history and protagonists of Italian psychology.

Established in 2005 as an interdepartmental center at the University of Milano-Bicocca and now part of *PASt - Polo di Archivio Storico* [Historic Archive Centre], Aspi is now facing the challenge to become the national on line knowledge-base and reference point of Mind Science documentations. Based on the framework Collective Access and the content management system Wordpress, both open source, the web portal and the database are built to allow users to

navigate and search biographies, commentaries, historical notes written by specialists. Furthermore people have direct and remote access to the high resolution digitalized documents and the synopsis of the manuscript letters and notes curate by experts in the field.

Among the key points of the project are: the cross-navigation paths based on the skills and knowledge shared by historians, curators and archivists; the searchability google-like recently implemented, the serendipity of discovering associations between the protagonists and further personal or professional relationships; the searchability of manuscript – transcribed or synthesized – and the remote access to date and material not physically stored in the same place.

The research project *L'archivio aperto. Strategie e strumenti digitali e semantici per la valorizzazione del patrimonio documentale. Quattro casi studio dal territorio lombardo* [The open archive. digital strategies and semantic tools for the documental heritage enhancement] funded by the Regione Lombardia in 2015 has allowed to implement further improvements to the portal and especially to work on the visualization of the relationships among biographies, places, archives and documents.

The project has involved in a multidisciplinary team: the Aspi center directed by professor Mauro Antonelli and scientific director of the project, professor Flavio De Paoli and Gabriella Pasi of DISCO (Dipartimento Informatica Sistemistica e Comunicazione) Department of University of Milano-Bicocca; Paola Zocchi (PASt) and Letizia Bollini (Department of Psychology) as project leader; Sara Radice and Simone Forte as Ux and UI designer; Michele Zonca, Fabio Sturaro and Stefania Marrara as Technological development; Paola Bianchi, Maria Cristina Brunati, Nadia Carrisi, Ilaria Fiori, Flora Santorelli, Giorgio Sassi e Daniela Scala as archivists and cataloguers; Promemoria Group as Technological Partner; ICAS94 (Milano): Verga's archive digitalization. Previous contributors to the project were provided by Dario De Santis, Daniela Scala and Elisa Montanari.

The multidisciplinary is also the approach adopted to redesign the existing information architecture of the portal, but, above all, to improve the data visualization navigation through all the various elements and variety of documents and format of which the archives are made. Competences borrowed from computer science, historical studies and archival expertise, user experience and user interface design, visual design, information architecture, information retrieval and data visualization were involved with the goal to open, not only in accessibility sense, the archives to a wider public. The focus of the project was to let emerge and make connections and relations among the protagonists of the mind science Italian history, the places —research centers, mental hospitals etc— and the documents of the digitalized archives with the aim of transferring the specialized skills of researches to a wider public of students, historians, or other people not competent but interested in the field from different perspectives.

3.1 *Navigation as access key to knowledge*

The project focused on the design of the navigation paths making available two different modes.

The first one – we can call it *traditional* or *hierarchical*— is finalized to find information already known by the user and oriented to a validation and a direct study of the primary documental source.

This is the typical expert experience: someone who already knows the field and the documents and wants to have a deep and wide access to original manuscripts and other documents.

On the other hand, a exploration modality, a *flanuerie* coexist for users which are exploring the field, following different and transversal paths or occasional discovery and associative further connections, eager to find a dystonia or a wired clue that opens unexpected perspectives among people, places and their relations. The driver of this approach is the serendipity and the casual discovery or the validation of an original hypothesis.

As presented in figure 1 —a biographical card— the right column presents a list of categorized links to retrieve further specific information about the author included the direct access to the personal archives with all the digitalized documents collected by Aspi.

Although the biographical description is rich of connections to other resources —that means people met or familiar with the subject or places where he/she could have lived— only who has a specific competence, knowledge and historical background is able to *read* this connections, give them an interpretation and a meaning. Only experts are able to *see* the connections and

qualifying them just as it is revealed during the interviews held during the analysis of the research. In fact in the first exploring phase, experts of the field —mainly historians and archivists— have been interviewed with an *expert walk through* approach to have a deep insight of the navigation and search strategies adopted by them. The *thinking aloud* practice and other quick & dirty user tests complete the starting scenario to contextualize the design choices.

Because of the aim of the project —to make knowledge accessibile not just in a techonlogical way— some other user tests were carried out having as subjects students of Phycology Bachelors and Master Degrees in parallel. This second panel of subjects was aimed to understand cognitive model and mental process during the navigation across biographical notes and archives documentations.

3.2 *Knowledge representation and invisible connections*

What generally remains invisible when managing a wide range of data and information is the connection among them and —if not expert of the field— the contest that allows comprehension and interpretation. This is the issue that the alternative visualization of the documents stored in the Aspi portal. According to the historical nature of the contents time was one of the main drive of the design conceptualization together with the effort to make the relationships not only *visible,* but also qualified.

Figure 1. Biography page: on the right side the list of organized connections.
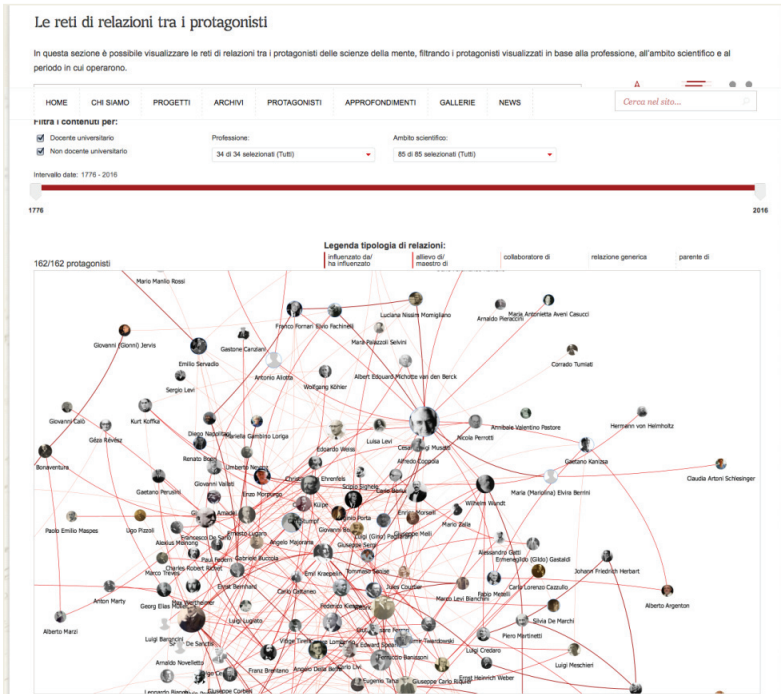
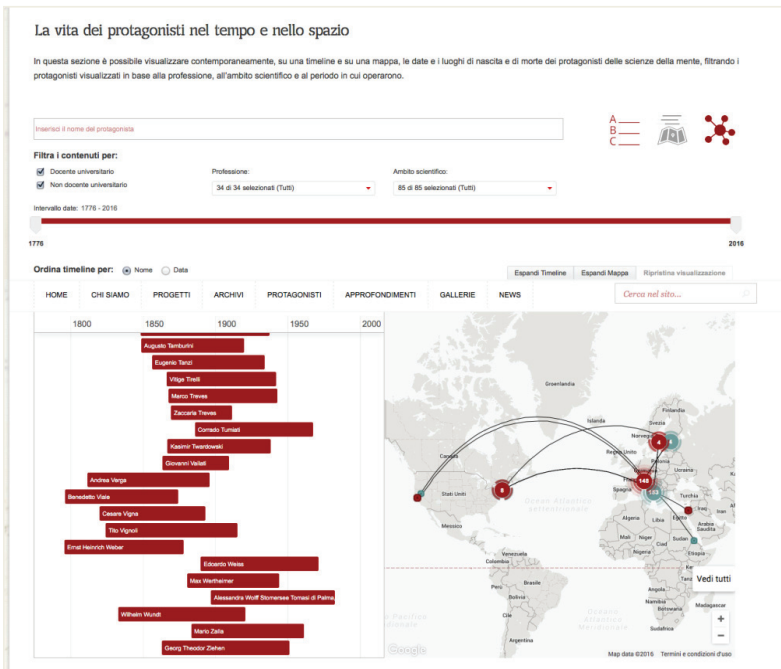Figure 2. The people relations' map: dynamic representation of personal connections.

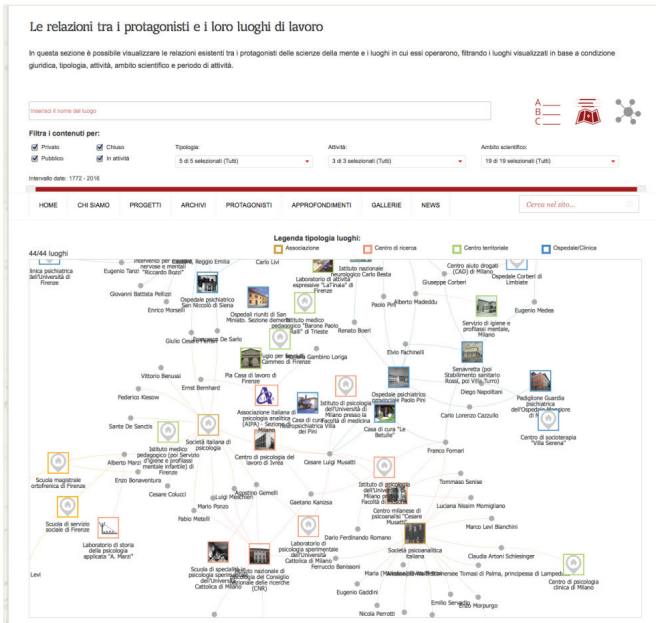Figure 3. The people timeline: dynamic representation according to time.

Figure 4. People and places' page: instuitional places.

So the 3 axis of the design proposal where: *people*, the protagonists, the professional connections and the personal bounds: *time*, both in term of developments/dyachronicity and simultaneity/synchronicity of historical events; places, as part of the institutional history of the Italian mind disciplines and as a co-presence of people or phenomena.

Figure 2 is a comprehensive view of all the protagonists who have a biographical card inside the knowledge-base and the connections that relate one to another. The web of lines and bubble can be directly manipulated to have different insight, to discover dens or weak relational clusters according to different criteria. Information can be filtered both among typological criteria such as profession, specialization field etc. or using *time* to limit or expand the range of people explored. Lines representing links among people are thin or bolder according to the *relational weight* of the connection themselves and use a colour code to describe the type of relation: personal/affinity or professional ones.

The same data are presenting according to a different segmentation and visualization criteria in figure 3, that means, the periodization according to a time-line (on the left side of the page) and places where people were born and died. Lines on the map describe connection of the two events and the density of contextual presence in the same places revealing the attractiveness of some research and work places.

Spatial criteria is the driver of the third representation: figure 4 shows the institutional places, research centres, associations, mental hospitals or asylums connecting and visualizing people who worked there in different periods.

4   CONCLUSIONS

The challenges that digital archives are facing are multiple to be sustainable, accessible and fully achieve their mission.

On one hand they must manage technological issues such as the openness and accessibility of the data. The lifecycle of digital obsolescence and digital heritage and of a chaotic development of storage standards and software formats.

On the other hand the focus is, further more, the user with his/her cognitive dynamics, background knowledge, mental models and process and, above all, needs. Needs which are

becoming even more immaterial such as involvement, active participation, access to specialized and niche knowledge, self training.

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