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Libraries, archives, museums between physical and digital space. Models and analysis perspectives

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Abstract:

The paper presents the general outline of a theoretical model in order to investigate the phenomena detected in the physical space and the digital space of the "MMAB. Montelupo Museum Archive Library", Montelupo Fiorentino (FI), whose inauguration is scheduled for 4 May 2014.

Within the same building will be co-located and co-managed the Ceramics Museum, the Archives, the Public Library, according to a project that involves the construction of a transverse interpretative environment beyond the identities of the individual institutions, where the heterogeneous objects evaluated within the related disciplinary traditions, will be collocated in orientated contexts to ensure intelligibility of new relationships which are expressive of the complex ways according to which the cultural memory is organized and comunicated.

The physical space will be investigated using the method described in the book "Lo spazio della biblioteca" edited by Maurizio Vivarelli (Milano, Editrice Bibliografica, 2013), which provides, in analogy to what happens in the field of "visitors studies" applied to the museum area to observe in a structured way the styles of uses of the space by different types of users.

The information contents of the digital space (on-line catalog, quantitative indicators of library service, the access log to the different websites) will be analyzed and studied with Tykli, a semantic search engine whose potentialities have been discussed at the conference La biblioteca connessa (Milano, March 13-14, 2014 http://www.convegnostelline.it/).

The goal, using the principles of Network Analysis is to identify and discuss the relationships between data in the different ecosystems of information, qualifying the information thus obtained both as tools to support common programming tasks, and to interpret, in an experimental field of considerable interest, the complex metamorphosis that are investing the identities, historically determined of the Memory Institutions as a whole.

Keywords: Physical Space, Data Analysis, Montelupo Fiorentino, Network Science

1. *Libraries, museums and archives in search of a common space*

Libraries, archives and museums are often natural partners for collaboration and cooperation, because they serve the same community, in similar ways. Their support and enhance lifelong learning opportunities, preserve community heritage, and protect and provide access to information have been thoroughly discussed in an interesting report promoted by IFLA in 2008.[1]

Still today are few the examples of full integration in the libraries, archives and museums field (LAM). Although the direction seems to be the right one and beyond the large narrative flowing around the subject of full integration, it still presents a set of problems to discuss and overcome. As he said recently David Ferriero (former director of the New York Public Library): "one of the core challenges facing today's librarians, archivists, and museum curators is the need for them to work across disciplines to deliver the integrated, seamless level of service that tech-savvy users are increasingly coming to expect."[2]Despite similar vocations as cultural heritage institutions, libraries, archives and museums naturally retain their distinct identity and their specific distinguishing features.

In their contribution *From coexistence to convergence: studying partnerships and collaboration among libraries, archives and museums,* the authors observe that "Yet while some cultural heritage organizations have departmental libraries, archives, and museums within one repository […] not all such institutions have common professional practices and access systems. The advent of digital environments and the ideal of increased public accessibility are but two factors that have led to calls for greater collaboration among libraries, archives, and museums"[3]. Collaboration and convergence of libraries, archives and museums, and of the affiliated disciplines (library and information science, archival and museum studies), have been discussed intermittently in the literature showing scarce research about collaborative projects.

What kind of effort are these institutions making in terms of collaboration and coexistence about integrated projects on the Web? Usually general public sees little significant difference between libraries, archives and museums and the new users of the resources of these institutions want to have the ability to discover, download, use, and repurpose those resources in the same way they do other digital resources on the Web.[4] For

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1 Alexandra Yarrow, Barbara Clubb, Jennifer-Lynn Draper, *Public Libraries, Archives and Museums: Trends in Collaboration and Cooperation*, The Hague, IFLA Headquarters, 2008 (IFLA Professional Reports, 108).

2 Chuck Laddy in Harvard Gazette, April 10, 2012 http://news.harvard.edu/gazette/story/2012/04/linking-libraries-museums-archives/

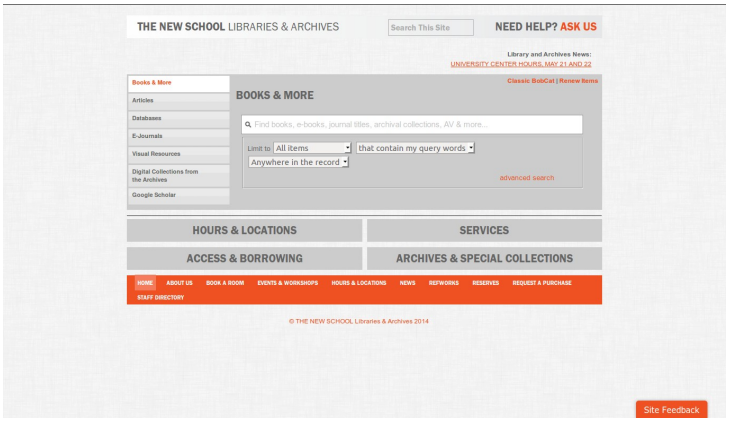
3 Wendy Duff, Jennifer Carter, Joan M. Cherry, Heather MacNeil, Lynne C. Howarth, *From coexistence to convergence: studying partnerships and collaboration among libraries, archives and museums*, *Information Research*, 18, 3, 2013, http://InformationR.net/ir/18-3/paper585.html.

4 Lisa M. Given, Lianne McTavish, *What's old is new again: the reconvergence of libraries, archives, and museums in the digital age*. "Library Quarterly", 80, 2010, 1, p. 7-32.

these reasons, here briefly recalled, collaboration among institutions aimed at increasing online access to cultural heritage resources is essential.

According to the existing literature there are several case studies of convergence through the development and implementation of integrated online access systems and digital-imaging programmes within these institutions. In the general context of this paper, one of the main problems is therefore to analyze a small sample of digital environments, to assess in which ways the convergence of archives is specifically designed and communicated through the Web, trying to highlight in particular the ways in which people interact with the information content of the specific website.[5] The aim of the analysis of the following short list of websites is to establish how archives, libraries and museums have introduced converging elements in the structure of the website.

1) The New School
http://library.newschool.edu/



Site type: Libraries and archives.
Country: USA.

Site description

The collection of New School Libraries & Archives is comprised of:

- Fogelman (humanities and social sciences);
- University Center (art and design);
- Archives & Special Collections (New School history);
- Kellen Design Archives (archival design materials and Parsons history);
- Scherman (music) collections;
- Electronic resources (e-books, scholarly journals etc.).

Audience

Currently-enrolled students, faculty, and staff. The site was built to support The New School's interdisciplinary approach to education and offer an excellent starting place for research.

5 Interestingly, in this perspective, is to take into account the content of Karen Smith-Yoshimura, Cindy Shein, *Social Metadata for Libraries, Archives, and Museums. Part 1: Site review; Parte 2: Survey analysis,* http://www.oclc.org/ research/publications/library/2011/2011-02.pdf.

Web 2.0 features explicitly offered

According to the *About* page, features of the site include: RSS feed; user interface themes; and collaborative filtering.

Potentially useful to libraries, archives, museums

The site is visually attractive and virtually/electronically brings together related materials that are physically dispersed throughout a variety of organizations. The advanced search provides the user with the ability to narrow the search by several criteria, including audience, resource type, format, and language. The search functionality also includes keyword searching and Google Scholar tools.

2) The Puke Ariki

www.pukeariki.com/

Site type

Archives, Library, Museum, Touristic Information.

Country

New Zealand.

Site description

Puke Ariki is an innovative museum, library and information centre that combines learning, knowledge, resources and heritage objects for a visitor experience that is like no other. Puke Ariki incorporates the New Plymouth i-SITE Visitor Information Centre, a valuable source of information about New Plymouth District, Taranaki and New Zealand.

Audience

General public.

Library

The catalogue contains all items held at Puke Ariki and District Libraries. Users can also access a wide variety of electronic resources such as online journals, research papers and databases using the keyword function on the catalogue search engine.

Heritage Collection

Puke Ariki's Heritage Collection contains objects, papers, photographs and maps - all of which provide a link to Taranaki's past.

Web 2.0 features explicitly offered: "The portal is an interactive and educational space where students, faculty and researchers can access, document, engage with and learn about the cultural heritage, histories and present-day experiences of Taranaki people. The site integrates Web 2.0 technologies such as custom tagging, geo-tagging, direct feedback loops, and user-generated comments to enrich user experience and drive a collaborative framework for knowledge sharing.

3) Trove

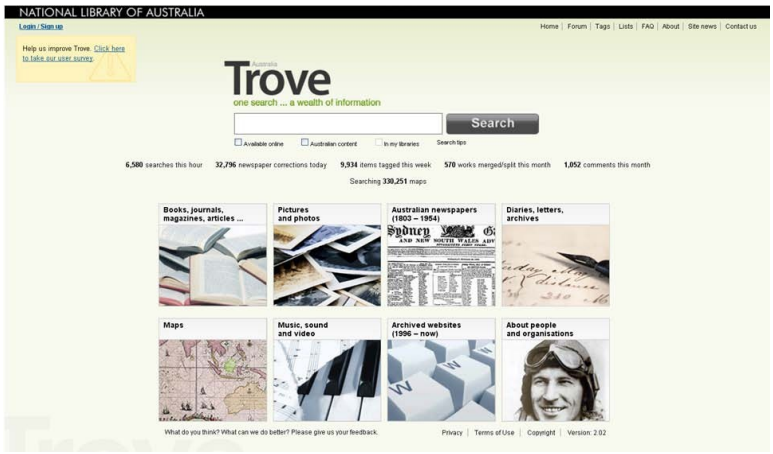
http://trove.nla.gov.au/

Site Type:

Archives, Community, Library.

Country

Australia.



Site description

Trove is a recently launched discovery tool focused on Australia and Australians with over 90 million items. It supplements what search engines provide, offering a single point of access to: books, journals, magazines and articles; pictures and photos (Picture Australia, see separate review); Australian newspapers; diaries, letters, archives; maps; music, sound, and video; archived websites; information about people and organizations; lists of related external websites. Users can send persistent links for any of Trove's items to Twitter, Digg and Facebook.

Audience

General public.

Potentially useful to libraries, archives, museums

The single search access across such abroad range of resources, presented in the eight groupings or zones with facets and option to restrict results to only those freely available online, is impressive. Related items include external websites, as well as resources within Trove.

2. *The design of MMAB*

On May 4, 2014 in Montelupo Fiorentino, a small town near Florence, was inaugurated the MMAB. Montelupo Museo Archivio Biblioteca. In a single space, which previously had been intended only for the Museum of Ceramics, were located the library and the archive. The project, which is still being completed, originated from a study commissioned by the City Council and prepared by a working group composed by Maurizio Vivarelli (University of Turin), Enrica Pagella and Carlotta Margarone (Museo civico d'Arte Antica, Turin), and Claudio Rosati (former director of museum services in Tuscany), with whom has been defined a conceptual and organizational common model, shared, in accordance with the general lines of analysis that involved the local context and the critical points highlighted in the previous models.

The Ceramics Museum (http://www.museomontelupo.it/mu/1/home/index.php) was opened in 2008 in a building dating back to the early twentieth century, formerly seat of a school. The area dedicated to the permanent exhibition is spread over an area of about 1000 square meters divided into 12 rooms on three floors, with the addition of two front side corridors on the first and second floor. The services of the library (http://www.comune.montelupo-fiorentino.fi.it/) are inserted in the current profile of the activities of the Cultural Center Nautilus. The project involved the creation of a common reception area, designed as a place of easy transition between the exterior and the interior.

After the reception area are located the spaces and the services of the library. The museum has been radically rethought in museological and museographic terms, strengthening the criteria especially for thematic rather than chronological exhibition. The elements of conceptual integration between the museum and the library are made evident in the space for the library, in which were kept many elements of nature exhibition (Fig. 1) ; in particular , in an environment of the library (Fig. 2) the ordering of the books on the shelves is enhanced by the presence of ceramics, or small displays of bibliographic materials.

Fig. 1 . Reading room in the library of MMAB.

Fig. 2 . Reading room in the library of MMAB.

The model of spatial organization of MMAB thus presents many interesting features to try to explore a central question, which in fact constitutes the central core argument of this paper. The main objective, at this early stage, is to show the problems and issues, both theoretical and methodological, through which it is possible to investigate, in a structured and systematic way, all the phenomena that lie in the space of MMAB. These phenomena are located both in the physical space and in the digital space. If we want to try to interpret what happens in a holistic manner in the space of the way is therefore essential to discuss, first, the analysis models of physical space and digital in their unique identity.

3. *Reading the space of libraries, archives, museums*

Museums, archives and libraries are entrusted the complex task of "aggregate information objects to help people to identify, access and interact with them"[6], trying to find, in their physical and conceptual space, a point of balance between order and disorder. With the coming and spread of digital technologies this search of the order remains alive but is rethought. In fact, "the information [and the knowledge that from and by it can be built] becomes smoother, [...] continuously reconfigurable, [taking] on the screen most different forms and turning into a visual labyrinth in which the first and most immediate guidance tool is made, metaphorically, from the look"[7].

From these considerations, it therefore becomes essential to reflect on the "form" of these institutions, on the properly physical space of these places, which is the outcome of a specific architectural project[8]; on the technical procedures by which can be defined the relationships between architectural space and informative contents. Investigating the nature

6 Francis Miksa, *Information Organisation and the Mysterious Information User,* "Libraries & the Cultural Record", 44, 2009, 3, in Maurizio Vivarelli, *Le dimensioni della bibliografia: scrivere libri al tempo della rete,* Roma, Carocci, 2013, p. 266. All the citations from this book are translated by the author.

7 Vivarelli, *Le dimensioni della bibliografia*, cit., p. 279. Translation by the author.

8 Some articles about it are: Helen Niegaard-Karen Latimer, *Introduction: a new tool for planning library buildings,* in *IFLA library building guidelines: developments & reflections,* edited on behalf of IFLA by K. Latimer and H. Nieegard, München, Saur, 2007; *IFLA: Intelligent library buildings. Proceedings of the tenth Seminar of the IFLA Section on library buildings and equipment. The Hague, Netherlands, 24-29 August 1997*, edited by Marie-Françoise Bisbrouck & Marc Chauveinc, München, Saur, 1999; *Library Buildings in a Changing Enviroment: Shanghai, China, 14-18 August 1999*, ed. by Marie-Françoise Bisbrouck, München, Saur, 2001; *Libraries as Places: Buildings for the 21st Century*, ed. By M.-F. Bisbrouck, Jérémie Desjardins, Céline Ménil, Florence Poncé, François Rouyer-Gayette, München, Saur, 2004.

of the connections between these three types of spaces allows to have an overview on the changes that contemporary society imposes on the conceptual and physical structure of libraries, archives and museums. For this purpose, these places may be conceived like texts, "the elements of which [...], give rise to a texture of different types of signs whose conditions of signification must be guaranteed by a code, and secondly to try to understand how may be implemented and configure the use, that is, the reading of this text"[9]. People using these spaces, therefore, can be thought of as readers of a text.

The need to understand the rules that drive the users/readers to use/read the space of the institution has led to embrace a qualitative methodology, that allows to study the user both in relation to its subjective characteristics both in relation to the social context[10].

4. *An olistic method of investigation*

Starting from these theoretical premises has been identified a method which incorporates all the different perspectives used for the analysis and evaluation of the space; the method, which due to its fundamental characteristics we could therefore define "holistic", is divided into the following phases:

- collection of the different types of sources related to the identification of the specific space (history of the institution, project documents, performance evaluations, qualitative surveys etc.);
- development of a questionnaire addressed to users, staff, policy makers, whose purpose is to collect information on the perception and evaluation of architectural space, in all its implications, and of the digital space;
- creation of an evaluation grid, that may be modified during the research, based on the result of the above observations and on the results of the interviews, in order to identify which are the most frequent types of behaviors adopted by users, in the different contexts. Without any intervention by the operator, will be observed the most frequently routes made by the users of the buildings. Some representative users will be selected for a targeted interviews or focus groups about their own perceptions of the architectural, digital and bibliographic spaces of the building, on the relational possibilities offered by the structure, on the quality of services provided and on the staff;
- evaluation of all the data, creating graphs and tables with the different types of activities carried out by the users; processing of a report to show the perceptions of the space based upon the analysis of the interviews[11]; creation of visual maps that show the most recurrent routes made by visitors during their stay in the structure.[12]

5. *Complexity of the concept of 'data'*

In the last decades we have witnessed to an exponential growth of data. There are huge quantities of information about every subject and this undoubtedly creates uncertainty, confusion, and we run the risk of get lost in it. In order to avoid this inconvenience we need

9 Vivarelli, *Un'idea di biblioteca. Lo spazio bibliografico della biblioteca pubblica*, Manziana, Vecchiarelli, 2010, p. 206-207. Translation by

10 These arguments are discuted in *Lo spazio della biblioteca. Culture e pratiche del progetto tra architettura e biblioteconomia*, [edited by] Maurizio Vivarelli, Milano, Editrice Bibliografica, 2013, p. 414-443.

11 This line of work will take particular attention of what are the techniques and methods of application of the current and the so-called *Post Occupancy Evaluation:* http://www.usablebuildings.co.uk/Pages/Unprotected/Newcastle2005POE.pdf; http://www.aude.ac.uk/info-centre/goodpractice/AUDE_POE_guide.

12 For the development and processing of this type of analysis we turned to the experience at the Danish library of Hjørring by Valinka Suenson and Henrik Harder, *The microsphere, the user and the architecture*, http://vbn.aau.dk/files/43872052/27058.pdf .

to dig up in these mines of numbers and symbols to extract information from a data set and transform it into an understandable structure for further use. We need to give them a meaning.

This process could be called generically 'data analysis', but lately we could refer to it as 'data mining'. There are no big differences between these two terms. The aim is the same: inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making. Specifically, data mining is an interdisciplinary subfield of computer science involving methods at the intersection of artificial intelligence, machine learning, statistics, and database systems[13]. The central core subject of data analysis, however, is definitely statistics. There are two kinds of statistics. Descriptive statistics is the first and basic level of analysis, but it is very important.

It provides a representation of the phenomena that must be studied, and allows you to start thinking about what is the nature of the data, and about what laws regulate them. Causality is, instead, the first thinking of statistical inference. If you know what are the influences in your data is, you will know what is your next move, or you will answer to your previous question: why did it happen? The relation between data is not the only result that you can obtain with statistical inference. You can also achieve, for example, a set division of your dataset in groups of subjects which are similar among them and different from others.

This method is called 'cluster analysis'. If the variables in the dataset are related with a response variable[14], then it is called classification analysis. Another reach, direct consequence of causality, is prediction or, even better, forecast. To reach these goals any statistical inference requires some assumptions. A statistical model is a set of assumptions concerning the generation of the observed data and similar data. Descriptions of statistical models usually emphasize the role of population quantities of interest, about which we wish to draw inference[15]. Descriptive statistics are typically used as a preliminary step before more formal inferences are drawn[16]. Every model starts with a particular question in mind: this is the first rule, and if you have to design a survey to obtain data, you have to know exactly what are you looking for. But this paradigm changes in our era. Data, more than ever, is already available and sometimes they drive to new questions. This is the new challenge that data and big data offer to us.

Lately, the scientific community is focusing on complex systems, a very generic field full of massive bulk of data. We are surrounded by these systems that are hopelessly complicated, from the society, whose seamless functioning requires cooperation between billions of individuals, to communications infrastructures that integrate billions of cellphones with computers and satellites. Our ability to reason and comprehend the world around us is guaranteed by the coherent activity of billions of neurons in our brain. Our very existence is rooted in seamless interactions between thousands of genes and metabolites within our cells. Given the important role they play in our life, in science and economy, the understanding, mathematical description, prediction, and eventually the control of such complex systems is one of the major intellectual and scientific challenges of the 21st century [17]. Since all complex systems have many interconnected components, the heart of this discipline is network science[18].

13Christopher Clifton, *Data mining*, in *Encyclopaedia Britannica*, http://www.britannica.com/ EBchecked/ topic/1056150/data-mining/281958/Additional-Reading Mining".

14 In an experiment, is the event studied and expected to change when the independent variable is changed.

15David Roxbee Cox, *Principles of statistical inference*, Cambridge, Cambridge University Press, 2006.

16 Michael J. Evans, Jeffrey S. Rosenthal, *Probability and statistics: the science of uncertainty*, Freeman and Company, 2004.

17Albert-László Barabási, *Linked : the new science of networks*, Cambridge (Mass.), Perseus, 2002. See also *Network Science*, http://barabasilab.neu.edu/networksciencebook.

18Ivi.

5.1 From data to network science

A network (sometimes also called 'graph') is a result of two elements: nodes and edges. Nodes are the main subjects of the network and they can be connected with other nodes by edges. Erdős and Rényi have defined the graph in their string of articles on random networks, and this is the original definition: G (N, L) model: N labeled nodes are connected with L randomly placed links[19]. Imagine that humans are the nodes, and that the knowledge relations between people are the edges. If you ever heard about the theory of six degree of separation, you were dealing with one of the most famous results of the social network analysis. The main idea is that you and everyone else on this planet are connected with a relationship path with no more than six people. And this applies to us all.

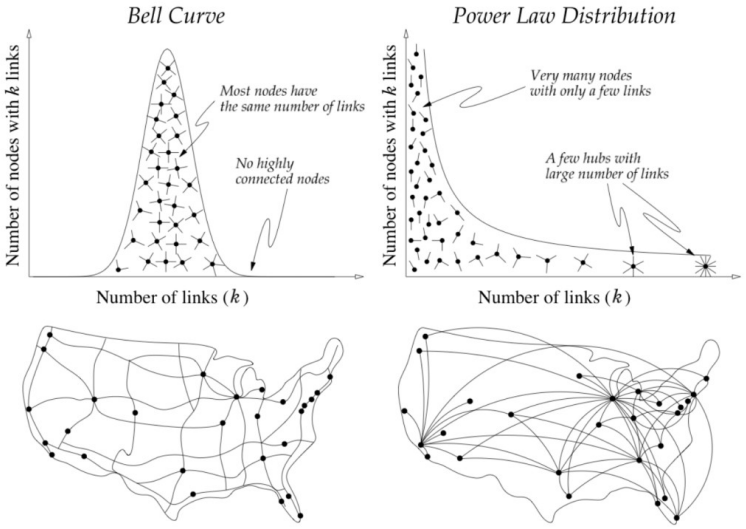


Fig. 3. Random versus scale-free networks [Barabasi – Network Science Book Project]

Today we know that the theory of "six degrees" is not a myth, even though it's not perfect and without critics. But the mathematical proof is very near because the average path length between two nodes in a random network is equal to ln N / ln K, where N = total nodes and K = acquaintances per node. Thus if N = 6,000,000,000 (90% of the World population) and K = 30 then Degrees of Separation = 22.5 / 3.4 = 6.6. (Assume 10% of population is too young to participate). This is impressive. After all we live in a "small world". But this is a result of the deep structure of our society; it is very dense, and for this reason coincidences can occur. Not at all! The small world property is true not only for social networks, but is present in many other networks. This result is one of the more popular and suggestive in the field of network science. The scientific explosion of this science experienced during last years is rooted in the discovery that, despite the apparent differences, the emergence and evolution of different networks is driven by a common set of fundamental laws and reproducible mechanism. Hence despite the amazing diversity in form, size, nature, age, and scope characterizing real networks, most networks observed in nature, society, and technology are driven by common organizing principles. The Web, obviously, is one of these networks. It is a network that probably contains already most of the human knowledge [20] and his size it is very remarkable. But we saw the size is not a real problem. Of course the results

19Paul Erdős, Alfréd Rényi, *On random graph*, "Pubblicationes Mathematicae", 6, 1959, p. 290-297.

20 By 2007, 94 percent of all information on the planet was in digital form. The total dimension at that time was estimated in 18.86 billion of gigabytes. Today, every two days, we create as much information as we did from the dawn of civilization up until 2003.

about degrees of separation it depends on the network. A famous study showed that the network of Web obtained 19 as a result of the average path length, that is one of the largest results comparing with other famous networks (Internet, language network, brain network, metabolic and protein networks, citation networks, etc.)[21]. What is really powerful is the capability to connect in a very few steps different sources and this ensure the connection between different types of databases and different kind of users. Then every user, consciously or not, can contribute to the heritage of knowledge. In our case the Web is not only a set of websites connected to each other, but every kind of document found in a webpage, whether text, video, music or, even more, a theoretical concept inside a document, can be a node itself.

Then there is the problem of usability and accessibility. We need a better and more structured schema instead of simple link between website pages. We need to put meaning in every connection. When we talk about 'linked data' we refer to a set of W3C standard for publication, sharing a correlation of structured data. Resource Description Framework (RDF) is a standard model for data interchange on the Web. It extends the data linking structure of the Web to use URIs to name the relationship between things as well as the two ends of the link (this is usually referred to as a "triple"). Using this simple model, it allows structured and semi-structured data to be mixed, exposed, and shared across different applications[22]. We can access RDF documents with SPARQL, a query language to obtain information about documents across different data sources. We give life to 'web of data', a network where data is semantically interconnected.

To understand how all of this information is connected and intertwined, there are mathematical measures in networks which tell us everything about the role of the nodes in the graph structure. One of these is centrality: some nodes play a more important role for the network configuration, than others. There are different kinds of centrality, the most important is degree centrality, actually the number of links of a node. It means that we could consider the node with higher degree centrality the most central node of the network and so on. There are still other measures like betweenness centrality that evaluate how much a node is able to join different groups, these kind of nodes are in strategic positions and connect different component of the network. Another important aspect of network science is visualization.

Looking at the network, or part of it, can be more explanatory than a thousand words; drawing a graph is not an ordinary activity. You have to choose layout carefully, in relation of what are you trying to say, if so. Colors, sizes and positions of the nodes can completely change the meaning of the network from human eyes, even in the network is exactly the same. In addition one could present interactive vision of the graph, for example begin from a different starting point, then, once chosen, highlight a network pattern instead of others. Real maps of knowledge can be created.

6. Data as traces

The basic concepts of data mining and network science introduced in the previous paragraphs provide useful methods and tools to approach the analysis of the huge amount of digital information typical of archives, libraries and museums. They produce and store many different kinds of data and here we try to summarize them in some macro classes:

– the informative content of the records in the catalog;

21 Albert-László Barabási, Albert Réka, *Emergence of scaling in random networks*, "Science", 286, 1999, p. 509-512.

22 See http://www.w3.org/RDF/.

- the informative content of the digital objects connected to the records, such as text, audio, video files;
- information about the audience and visitors behavior in the physical spaces, in all its components;
- logs of the users searches trough the Web portals and the online catalog;
- users behaviors and conversations collected via the social networks.

All of those datasets can be analyzed to outline the profile of the "Institution" which produces and store them, and their social impact. In our model we approach the analysis considering:

- each dataset as single and isolated;
- every datasets as an heterogeneous *unicum*;
- expanding every dataset using data enrichment techniques.

The results became more and more interesting in the perspective of a convergence of different institutions, and then considering the same datasets coming from different sources. That does not require a physical unification of the original data archives into a common database. The analysis process considers different steps to acquire (read) and federate source datasets to represent the significant corpus of data to be mined. Here, in the case of a convergence of data coming from different institutions, graph based data models and network science approaches play a crucial role. Those techniques in fact are flexible enough to represent and deal with complex and heterogeneous data. We have to consider that everything would become a node: items, artworks, authors, subjects, topics, concepts, dates, and comments or users feedbacks. Every node would be linked with any other according with its relationships; those links are automatically generated during the step of data acquisition and network building. For instance fig. 4 is a sample visualization of the network that Simon Rapier put together to show interconnections among philosophers.

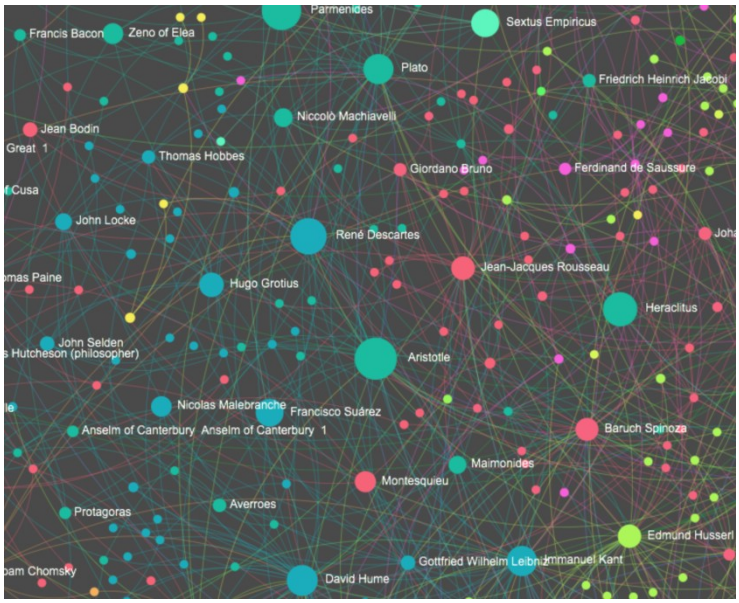


Fig. 4 – Graph visualization of the history of philosophy
(http://www.designandanalytics.com/philosophers-gephi/)

There are almost no limits in size and variety of data that would be included. The resulting network is a valid and powerful representation of the identity of the Institutions and we have the chance to investigate such representation. The development and adoption of specific network analysis algorithms leads to a model that enable to:

- highlight hidden relationships and patterns;
- identify objects, actors, concepts and activities which are central in the dynamic behavior of the resulting networks;
- discover unexpected paths which relate and keep close different artworks coming from distinct catalogs.

According to this point of view the data is able to express itself not in an aggregate form but in its complexity and entirety. From these theoretical and methodological premises can be clearly identified some specific fields of application, and the study of a new data analysis model able to reflect the variety of digital asset typical of memory institutions, leads to concrete opportunities to:

- understand the relationships derived from the convergence of knowledge coming from different sources and different history;
- keep informed decisions to get value from more effective uses of spaces and contents;
- make more usable and accessible the entire heritage / asset;
- let people freely follow the discovery paths best match their interests.

7. Conclusions

The analysis of the physical and digital space of MMAB presents to our notice many points of interest, which in this paper have been briefly presented in their most significant theoretical and methodological implications. From the month of September will start the empirical phase of data collection, according to the general rules that have been discussed here. The complexity of the phenomena that occur in the physical and digital space of libraries, archives and museums make it essential to define a frame of interpretation wide, systematic and integrated, thanks to which we believe it will become possible to better understand two sets of twisted facts. The first area is the analysis of what occurs in the physical space, and that, therefore, concern the interactions between the “signs” in the space and their perception and interpretation by the people. The second area is the set of digital tracks , which are regarded as “signs” written on the Web. The principles of network science, discussed above, can be a tool of fundamental importance to understand what these "signs" mean, both as traces of the uses that people make of the space, and as elements that connect the digital space of MMAB , to the wider space of the Web, in large extent unknown. Our goal, from the case study, is to build a model of interpretation applicable to the analysis of any type of space, to emphasize the elements of integration which, of that space, define the specific and peculiar identity.