Architectural Historiography and Database Design: An Alliance to Empower Research in Modern Heritage

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Abstract

This paper maps some of the current insights of critical architectural historiography that can inform database design, in order to rethink traditional tools of architectural documentation, and demonstrate new opportunities of conceptualising innovative applications in architectural documentation. Specifically, the paper analyses the design logic of a digital documentation and research tool that is being developed at the Mesarch Lab of the Department of Architecture, University of Cyprus (UCY) through the collaboration of architectural historians and database experts that aim to incorporate theoretical and methodological advancements in the field of architectural history into an innovative database system that enables researchers to efficiently store, annotate and organize historical data in ways that facilitate further scholarly analysis and research.

The paper analyses the core element of this research tool: an enhanced information model, which was designed to support a comprehensive and systematic documentation of various categories of the built environment (from buildings and complexes, to infrastructures and landscapes); overlapping networks of actors involved in the funding, design, and materialisation of projects (from individual designers, offices and engineering firms, to governmental departments and users); and interconnects them with architectural representations and other diverse types of cultural content. Based on state-of-the-art database design and knowledge discovery practices, this tool increases the complexity of historical databases and their potential for cross-referencing, ultimately enlarging the digital context in which architectural history is being documented and studied. The paper finally considers this research tool's future development and it's potential to facilitate informed and nuanced understandings, interpretations and evaluations of architectural history that aim to further support in-depth studies and cross-disciplinary research on modern architectural heritage.

Keywords: modern architectural heritage, critical historiography, database design, digital libraries, research tools

1. Introduction

Current methodologies of architectural history and historiography focus on architecture as profoundly social and cultural project, having decidedly moved the field away from stylistic analyses, or single-minded narratives, to uncover the complexities of architectural history. Engaging with an in-depth analysis from multiple perspectives, these advancements have forged new and more complex alignments between the history/theory and criticism of architecture, and the scholarly domains of the social sciences and the humanities. These interdisciplinary methodologies employ multiple theoretical tools spanning the disciplines of architectural history, postcolonial theory, environmental history, and cultural studies as demonstrated by the work of various scholars. (Gaonkar, 2001; Appadurai, 2000 and 1996; Hardt and Negri, 2000; Escobar, 1995).

Among the main research topics that prevail in the above field is the scholarship on Modern architecture, which uncovers the fascinating interconnections between architecture and larger sociopolitical and cultural processes such as modernization, decolonization, nation-building, and development in the second half of 20th century. (i.e., McLaren, 2006; Pyla, 2007 and 2006; Cohen and Eleb, 2002; AlSayyad, 2001; Wharton, 2001; Bozdogan, 2001; Vale, 1992; Nabantoglou & Wong, 1997, Scott, 1998). Particularly, up-to-date scholarship aims to situate built works within the larger sociopolitical context that influenced their design and implementation, and to reflect on their social, cultural, and environmental impact as well as to map transnational flows of ideas, people and capital, and investigate how the practices of architects and/or their patrons (individuals, states, or corporations) have been intertwined with visions of social change, practices of economic development, or even agendas of political power. (Pyla, 2013; Stanek, 2012; Pyla and Phokaides, 2011; Healy and Upton, 2010; Latour, 1996)

Even though architectural historians have taken grade strides in demonstrating the complex entanglement of modern architecture with cultural and social values, economic and political processes in Europe and the rest of the world, neither heritage studies nor their alignment with digital technologies have adequately incorporated these insights into the increased understanding and interpretation of cultural heritage. This paper focuses on the development of a research tool that draws on the above referenced work, investigating theoretical questions, research challenges and methodological insights of current interdisciplinary research approaches on architectural history, and translates these insights into the creation of a digital research tool that is sensitive to the complexities of historiographical research and to put forward new research enquires tailored to modern architectural heritage.

Premised on the rigors of historical research and historiographical theory, this digital research tool transcends traditional documentation models in architecture, firstly by extending them and secondly by aligning them with current state of the art in database design of digital libraries. The paper analyses the key feature of this research tool, an enhanced information model that aims to support a comprehensive, systematic documentation of architectural history in ways that facilitate further scholarly analysis and research. Firstly, it makes reference to traditional documentation models and recently developed digital architectural libraries aiming to highlight some of their advantages and limitations. Secondly, it analyses the key elements and innovative features of the information model and then it presents the overall design of the database system that supports the overall functionality and performance of this research tool. Finally, the paper considers the future development of innovative tools based on the system's open and expandable architecture. These extensions will attempt to enhance the research tool's potential in facilitating informed and nuanced understandings, interpretations and evaluations of architectural history and thus further support in-depth studies and cross-disciplinary research on modern architectural heritage as well as its dissemination to wider audiences.

2. Architectural documentation models and state-of-the-art digital libraries

Current digital documentation and cataloguing models form the basis for various research activities that include the conservation and documentation of architecture, archival and museum practices. They also form key components in the most recent developments in digital libraries

and online collections that have significantly aided the communication and dissemination of data to researchers and wider audiences. (Armstrong 2006; Kleimann, 2001)

Apart from a few common information that are used when cataloguing architectural heritage (i.e., name of architect, date of construction, location info etc.), information models are largely customized to meet the needs of their indented use (research, documentation, conservation etc.), the context they address (i.e. regional, national, transnational) and the larger scope of the research project they are developed in. This variability is of great importance as it affects the historical research and the study of architectural heritage, which depend on the documentation, and organization of data as much as on the study of physical objects (i.e., buildings, drawings, etc.). It can be thus argued that the use of particular information models has a decisive impact to the practices of documentation, by performing series of conscious and unconscious decisions of which information is, and which is not important to record and to preserve. In effect, documentation models can have a decisive impact onto the understanding, interpretation and evaluation of the built environment.

2.1 Documenting Modern architectural heritage

The well-established practice and research field of documentation of cultural and architectural heritage has been particularly focused on archaeological remains and sites and historic and iconic buildings constructed up to the early 20th century. The promotion of the widely appreciated goal of caring and protecting significant aspects of tangible heritage, has also nurtured alliances between conservation practices and emerging digital tools and technologies such as 3D modelling and scanning, digital databases and libraries. (De Luca et.al., 2011; Remondino, 2011; Addison and Gaiani, 2000). In contrast, mid-and-late-20th century architectural heritage has seen a slower development in receiving wider social appreciation and, especially, in regards to incorporating digital tools for expanding the study of modern architectural heritage.

In this direction the work of DoCoMoMo, the international organisation dedicated to the documentation and conservation of Modern Movement, has made significant advancements. In order to develop a universal system for the documentation and the evaluation of Modern Architecture in various contexts, DoCoMoMo fabricated a cataloguing schema called Full Documentation Fiche (DoCoMoMo, 2003). Besides standard descriptions of a building or a landscape (i.e., identification, location info, important dates, original and current use, changes, alterations etc.), the Fiche promotes the evaluation of a building through a technological, social, aesthetical and cultural perspective. These evaluations aim directly to demonstrate a project's overall historical value (in a particular, regional or national context) and to justify the importance of its protection and conservation. Amongst the significant features of the DoCoMoMo documentation model lies a comprehensive classification system that aids the categorisation of buildings according to uses and program types.

DoCoMoMo's documentation project however considers only realised projects thus missing out a substantial part of modern architectural history consisting of unrealised work, such as competition entries, conceptual designs and unfinished projects. In addition, it attributes secondary value to the representations of a project while related aspects of the cultural background are simply unrecorded. Its focus on national or regional level, has also been limiting in that it does not easily account for transnational perspectives such as the transfer of ideas from one context to another. Finally, the results from the widespread documentation practices by DoCoMoMo members has been until recently purely 'analogue' and static and has been poorly disseminated both inside and outside of DoCoMoMo community, thus falling behind of what has been the main target of emerging digital and online collections and libraries in last years.

2.2 Examining the current state of the art in digital architectural libraries

The increase of digital collections in the recent past has been driven by funding programs that promoted digitisation as a decisive step into the protection of tangible cultural heritage (i.e., archives and artifacts) and its dissemination to researchers and wider audiences through online platforms. Projects such as Europeana (2015),

supported by EU funding, and private and non-profit initiatives such as UbuWeb (2015) and the Internet Archive (2015) among others, have been amassing and publicizing various kinds of digitised content: i.e., photographs, books, films, sounds, music etc. They are also contributing to an emerging culture of sharing online digital content that is widely established. For example, Flickr (2015) provides an online platform that brings together everyday users, with professionals and public archives and libraries, publishing and exchanging precious archival documents with 'trivial' material.

Archival institutions also increase their efforts to digitise part of their collections in response to architectural historians and other scholars' demand for archival study. Recent digitisation projects utilising web-facing platforms for online access to their digital collections revisiting documentation issues through the approach of database and website design. Two such examples will be evaluated here: The first is the *Marcel Breuer Digital Archive* (MBDA) which was the outcome of a collaborative project headed by Syracuse University Library, that brought together various collections of archival material related to the work of the German architect Marcel Breuer (1902-1981) (Breuer.syr.edu, 2015). The second is the *The Archigram Archival Project* (AAP) that focused on the dissemination of the 1960s' architectural group's archival collection. It was run by a team from the Research Centre for Experimental Practice at the University of Westminster and was funded by a Resource Enhancement Grant from the Arts and Humanities Research Council in the UK. (AAP, 2015)

The Marcel Breuer Digital Archive and the Archigram Archival Project, launched in 2012 and 2010 respectively, acknowledge the research and cultural value of all forms of tangible architectural heritage, providing access to digital versions of traditional architectural material such as buildings' drawings, and photographs together with other documents such as personal writings, letters, manuscripts, papers, slides (MBDA, 2012); as well as magazines, articles, slides and multi-media material (AAP, 2010). In effect, both projects were developed around complex information models with multiple entities, while using tools (i.e. filtering) to facilitate easier searching and

alternative presentations of data by allowing the cross-referencing of digital material with projects and people, thus providing additional information on the network of collaborators. Although both projects exhibit the current state of the art in digital libraries they focus only on the production of a single creator or team of designers. As such they do not eventually promote the association of architecture with larger cultural processes and values; nor do they reach out to collaborative research projects in the larger field of digital scholarship.

Contrary to the MBDA and the AAP, Archnet (one of the first examples of online digital collections and databases on architectural history launched in 2002 by a partnership between Aga Khan Trust for Culture and the Massachusetts Institute of Technology (MIT)), is not focused on the work of a single author or the collaborative project of one group, but it is rather centred on the sharing and dissemination of knowledge "[on] the built environment of the Muslim world" (Archnet, 2015). Archnet's main element, the "Archnet Digital Library", is a resource that consists of both historic archives and documentation on contemporary building trends, that provides access and sharing of visual and textual material; and an online international community of experts (scholars, students, and professionals) in the study of the built environment in Muslim societies. Archnet's Digital Library is developed on a limited information model that does not provide information on the cultural background or the larger network of actors related to the design, realization and use of architecture and its representations. Nonetheless, Archnet's strong feature is the creation of a common online platform that allows sharing of data and research knowledge while continuously mapping a broad architectural culture that is transnational and inexhaustible in nature. While this is an exciting joint research project of transnational level that received an upgrade in 2014 (Archnet 2.0), it does not reach wider audiences to promote the broader understanding of values associated with the architectural heritage of Muslim societies.

3. Fabricating an enhanced information model

The research tool under development has fabricated an enhanced information model, with

multiple entities along the lines of MBDA and AAP, with innovative features that support autonomous entities *Projects*, *Actors* and *Media* that can be directly associated to each other. All data inserted in the database is placed under one of these three entities, and it is then cross-referenced to other data and digital material in the database. By supporting a more complex cross-referencing this information model aims to facilitate a comprehensive and systematic documentation of architectural history, which includes: i) the recording of a wide spectrum of types and scales of architectural projects; ii) the mapping of the various key individuals or groups that were involved in the processes of funding, designing, building, or using the projects; and iii) their association with a wide array of documents or representations in digital form such as digitized drawings, audio-visual material, reports, etc.

3.1 Projects: from the history of buildings to the history of the built environment

"Projects" are architectural projects such as buildings and building complexes but also include urban schemes and infrastructures, gardens, landscapes, product and interior designs. Covering various categories and scales of both realised and unrealised works of planning and design, the "Projects" reflect on the one hand a conscious effort to shift the focus away from the history of autonomous buildings to that of the wider built environment, and on the other hand to account for unfinished projects, competition entries, private and public commissions, conceptual designs and architectural ideas that have shaped the history of architecture as much as realised projects have.

The documentation of "Projects" incorporates at least a 100 fields consisting of common identification data (i.e. project title, address, location, design and completion dates etc.); a short description; and various other fields that hold important information: such as the main (i.e. reinforced concrete structure, metallic structure etc.) and secondary construction system(s); the program type (i.e. Residential, Commercial, Administration, Health, Law etc.) in accordance to original and current use(s) (i.e. Apartment Building, Show-room, Government, Banks, Markets); or the alterations that took place (i.e. Renovation, Restoration, Demolition etc.). The two latter fields

allow the documentation a Project's timeline and key episodes of its history and further monitors its future development. The Project's timeline aids historians' examination of the creators' initial intentions, the users and others' subsequent appropriations and also informs current aspirations for the projects' protection, conservation, reuse etc. In addition, an unlimited number of field reports from in-situ visits providing information on Project's current state and physical condition are also included together with references and other sources that can assist further research and enhance the overall potential of this model to inform heritage studies and management.

The documentation of different types and scales of projects, aims to support a more comprehensive understanding of the built environment and it's shaping. It covers a broad spectrum of scales and spaces: from domestic/interior space, to urban and designed landscapes, facilitating a multifaceted examination of cultural processes interacting with the built environment. By helping the understanding of the intricate ties between architecture and the social and political history a valuable resource for historiography and humanities research can be produced. The complex cross-referencing of Projects to other database entities further enhances this tool's potential.

3.2 Media: from projects' representations to context

Recent scholarship on architectural historiography and cultural studies has shown the complex interconnection of Modern architecture and media (Colomina, 1996); as well as the importance of various kinds of media (i.e., representations, films, paintings etc.) in offering insights for the interpretation and understanding of sociopolitical and cultural background (Kellner, 2003; Hall, 1997). In light of this, the conception of this research tool treats Media with a dual status: both as a *document* of the design and creation process associated directly to specific Projects, and as a trace/fragment of the cultural background.

Media thus consist of digital copies of various types of Projects representations such as drawings, photographs, publications, notes, sketches, briefs, and any other kind of record produced during the

design and implementation process, holding valuable information on the history of Projects. The primary sources for these types of records are private and public architectural archives, thus offering insights into the creative oeuvre of designers, teams and offices; the design and architectural culture and the practices involved in the construction sector.

In addition to the Project's media, this category also includes autonomous media that might consist of newspaper excerpts, popular magazine covers, documentaries, films, interviews, advertisements, government records etc. The combination of both kinds—Projects' media and autonomous media—aims to shape a large pool of records of architectural representations stored and presented together with heterogeneous sets of cultural artifacts. This multiplicity of Media, which are then directly associated or cross-referenced to Projects, is an advancement to traditional documentation models and offers a significant innovation for architectural history and heritage studies: It allows to situate architectural production in a broader cultural context and thus to map more complex associations between cultural processes and the shaping of the built environment.

Media as a partly autonomous entity can grow independently from Projects, by accumulating more and more diverse material such as adaptations of the existing media items and research products that reflect on the database's existing collections. This way, it has the potential to support studies on tangible heritage (buildings and their representations), and reflections on their intangible aspects by including for example interviews with designers, architects and users and other key actors. It can also extend into the field of digital heritage by including for example 3D renderings and other digital reproductions of projects, offering opportunities to study in depth or even renew previous assessments of projects that were never built, demolished, or seriously transformed or even ruined.

As the collection of Media increases in number and variety, it will enrich the direct and indirect connections with the Projects. This will ultimately expand the potential of this research tool to situate architectural histories against a broader (digitalised) cultural background, reflecting on the processes that shaped it and the various Actors that operated within it.

3.3 Actors: from 'authors' to networks

The third entity of the information model aims to expand traditional documentation models and architectural historiography that was until recently considering architects and engineers as primary authors of buildings. Instead, the entity of Actors refers to multi-scale and multiple-role actors that include individuals, teams, firms, companies, offices, government departments, as well as national and international organisations. This diversity aims to document a far more detailed architectural history by mapping all those that were involved in funding, design and realization and the use of Projects. Furthermore, it allows to further investigate the Actors' role in transferring knowledge, labour and capital; carrying beliefs and ideas and promoting agendas and discourses, which they eventually transformed, challenged or confirmed, through the shaping of the built environment.

For these qualities to emerge the information model includes descriptions of the Actors (name, date of birth-death, short bio etc.), but is strong feature its the way it thus forms direct associations with the other database entities: firstly by assigning Actors roles in Projects ('Actor role': Owner, Patron, Designer, Architect, Landscape/garden designer, Interior designer, Consulting engineer, Government Official etc.) and "Creator's role" of Media (i.e. Designer, Director, Painter, Photographer, etc.). Through these complex associations this information model marks its potential to move away from static documentation models into more dynamic mapping of complex interconnections.

Towards this direction, Actors's data do not only offer information on who the Actors were, but also when and where they were educated and practiced and when and where they were associated with other Actors. These associations between Actors are performed on two levels: firstly, by mapping Actor's involvement in specific Projects, thus emphasising especially how the Projects themselves shaped networks and flows of actors, expertise and know-how. Secondly, by recording their inter-personal or professional associations that may indicate collaboration,

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friendships and partnerships, employment status and corporate hierarchies. In effect this allows the mapping of overlapping networks of actors which span local, national and transnational levels, that offer information on institutional contexts, the nature of architectural practice, the cultural, socio- and geo-political background and their complex interconnection with architectural histories.

While the power of the proposed research tool rests on the comprehensive information model explained above, its effectiveness relies on the design of an advanced platform/prototype to allow researchers to store, catalogue and retrieve data cross-referenced to visual material, through a user-friendly interface.

4. Platform / Prototype

The proposed system was developed using state of the art technologies in database systems and website application development. It consists of two major sub-systems: i) **the data management sub-system**, which is composed of a relational database that stores information about Projects, Media, Actors and their relationships encapsulated under the unified information model that was mentioned in the previous section; ii) **the knowledge discovery engine** that enables the automated extraction of patterns representing knowledge from the data stored in the data management sub-system using a number of classification, grouping and aggregation techniques; and iii) **the web-based end-user interface** build using HTML5 and CSS3, which includes a number of facilities for managing the data but also allowing effective and efficient querying of the information stored along the multiple aforementioned dimensions in an intuitive user-friendly manner.

The system also features a number of attractive qualities including openness and expandability in order to support the inclusion of other data providers, and scalability, in order to maintain adequate performance when vast amounts of digital media are introduced to the system.

4.1. Data Management sub-system

The data management sub-system realizes the proposed information model by organizing data around the three basic entities, Projects, Media and Actors. Over 100 dedicated fields constitute
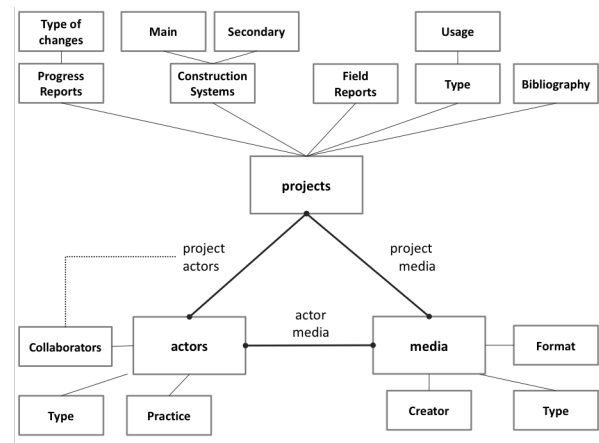

Figure 1. A high-level conceptual view of the information model

the information of a Project, organised in 16 tables and 14 relationships between the tables. Media are connected with over 40 dedicated fields, organised in 7 tables and 7 relationships between the tables. Similarly to Projects, they include standard information such as title, format media type and description. Additionally, they are associated with a number of keywords/tags. Finally, Actors have a total of 27 fields and are organised in 9 tables and 11 relationships between the tables Actors are linked with any project they were involved or had any type of impact in its creation. This creates an acyclic graph of relationships between projects and actor involvement that serves as the foundation for generating an innovative feature, the so-called "Geographies of Practice" that is described below. These relationships also form indirect associations of Actors with Media. Furthermore the system supports autonomous entities indirectly associated (i.e. through tagging) to the rest of the entities.

4.2. Knowledge discovery sub-system

The knowledge discovery sub-system defines a sequence of mappings from the low-level concepts (i.e., Project, Media, Actors) to higher-level more general concepts. This allows the organization of data under multiple dimensions where each dimension contains multiple levels of abstraction defined by specific concept hierarchies. For example, by utilizing the explicit link between Project's and Actors and the Actor's role inside a Project we can implicitly infer the collaborations of an Actor with other Actors in the context of the same Project (i.e., define a higher dimension for

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the actor entity). Subsequently, we can also augment the time factor into the aforementioned concept hierarchy in order to introduce the higher-level dimension that represents actor collaborations over time.

In order to support these concept hierarchies and the calculation of useful statistics, the knowledge-discovery sub-system incorporates mechanisms for storing the data in multiple levels and provides a number of distributive (i.e., count the projects where an actor was involved) and algebraic (i.e., the average number of projects per year that an actor was involved) measure calculation mechanisms.

4.3. Web-based user interface sub-system

The primary objective of the web-based sub-system is to deliver content to the users in an intuitive and user-friendly manner. Currently, the system features a responsive design that dynamically adapts the content according to the visual capabilities of the device that access it.
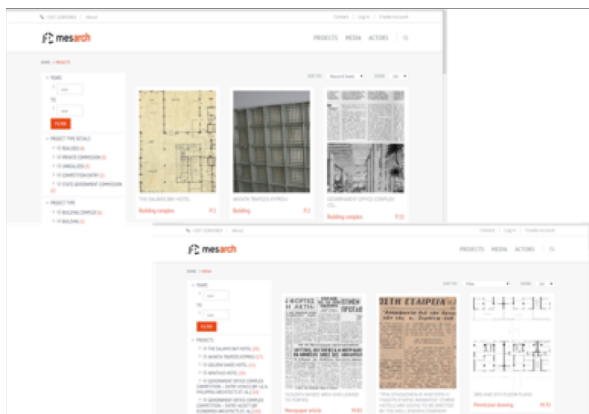

Figure 2. The prototype web-based graphical user interface of the proposed system enables the user to query and filter results with numerous parameters

It's more powerful however features reside inside the querying system that enables researchers to query the information stored along multiple dimensions in an efficient and effective manner. Multiple levels of filters are provided to facilitate easier searching, such as Project type or Project location but also real-time filtering by showing the number of results in each filter level (i.e. Project, Media, Actor) as shown in Figure 2. The system also supports advanced search, where users can provide multiple filters simultaneously using Boolean keywords and retrieve fine-grained

results. Through the same web interface, users can also add, edit and manage data within the system, including data about the main entities and their inter-relationship information.

4.4. Security and Privacy

The system employs specific security and privacy mechanisms that allow different levels of visibility to the data. Two distinct categories of data are supported: private data, which can only be accessed through administrating roles and high-level users; and public data, which can be accessed freely by all interested parties. More specifically, the system allows sharing of public resources to experts, teachers, students and citizens thus disseminating information on cultural heritage to a wider audience. The sharing is supported through specific procedures in the data management system and facilitated through smart interfaces tailored for tablet and smartphone devices that are now more common to various user groups.

5. Disseminating and shaping knowledge: Notes for future tasks

To further utilise the potential of the extended information model and the innovative database design explained above, additional features/ enhancements are being planned for the next stage. The primary aim of these features is to expand the system's capacity to facilitate the shaping of structure data into scholarly knowledge, ultimately, empowering profound studies of modern architectural heritage while supporting its wider appreciation by experts and non-experts alike.

Future work will be developed along the following three directions:
a. Firstly, to design and implement tools that further enhance the answering of multi-dimensional enquiries from multiple perspectives/ disciplines by utilizing the "relationships" and mapping of seamlessly different contexts between artefacts (i.e., Projects, Actors, Media). An example of such a use case is the feature of "Geographies of Practice" which highlights an important aspect of modern architectural history. These Geographies of Practice pertain to both the network of actors (who practiced/collaborated where) and the project's network (how the project itself created networks of expertise, know-how, etc.). This

feature combines data already inserted into the database that help mapping *network of actors* that records who the actors were, the different contexts in which they operated (i.e., educated, practiced, travelled) as well as the *project's actor network* that allow understanding how the project itself created networks of expertise, know-how, etc. In addition, modern visualization components may be incorporated to illustrate the results of these tools. For example, a graph report could be developed to summarise and visualise the collaborations between different actors through their participation in a Project, as seen in Figure 3.
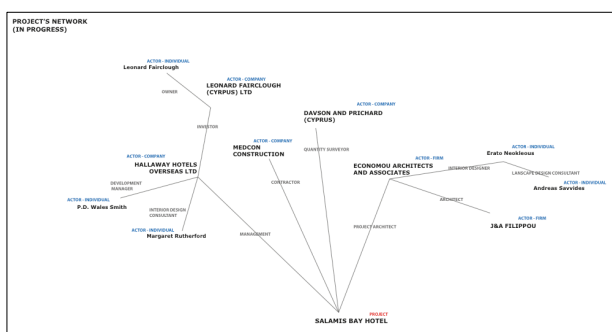

Figure 3. A diagram showing the network of actors created through their participation in a specific Project

b. Secondly, to extend the system's interactivity by adding features that give authorised users opportunities to organise data in meaningful ways that utilise the resources of the system for research purposes and promote alternative and complementary understandings and evaluations of architectural heritage. For example, the feature of "Workspace" can be introduced as a sophisticated virtual space that allows researchers to save important, recent or custom queries and results, as well as particular Projects, Media or Actors, in order to have immediate access for later study while performing daily research activities. In addition, a "Virtual Exhibition" feature can be introduced in order to allow authorized users the option to gather Projects, Media and Actors info to organize virtual exhibition sessions around specific topics or themes. These customised groupings could allow the development of users' own evaluations and interpretations of architectural heritage. These could also be shared with other users creating complementary and contested understandings of heritage values, thus bridging the divide between expert and non-expert users.

c. Thirdly, to extend the proposed system in ways that facilitate collaborative research on architectural heritage. The development of such features will built on the existing open and expandable system/information model to enable future partners to accommodate different forms of data according to their unique requirements. It will also develop a security infrastructure featuring security protocols and mechanisms to fulfil multiple end-users needs and responsibilities. It can thus allow specific security and privacy mechanisms to assign different levels of visibility to the data, allowing for example private data to be visible between specific users. With this feature, the system could accommodate at the same time register or unregistered users with viewing but no editing rights, all the way to administrating roles with full editing rights. It can also accommodate multi-functional research groups where partners have varying responsibilities and their own internal hierarchies.

5. Conclusions

This proposed research tool is promoting in-depth historiographical and heritage studies at a critical time when the works of modern architecture are being assigned heritage status internationally. It offers a comprehensive and systematic documentation model of architectural history, as well as enhanced cross-referencing tools that facilitate the monitoring of the built environment informed by an understanding of the cultural processes and the overlapping networks of actors that shape it. In such a way it significantly advances traditional tools of architectural documentation offering a solid step into digital scholarship anticipating cross-disciplinary research in heritage. As cultural heritage is migrating to digital formats, the future extension of this research tool can ultimately offer an effective preparation of digital humanities and historical research to address a foreseeable challenge: that of the proliferation of digital cultural content, which will demand the use of computational technology and methods for examination and analysis completely transforming our understanding of social, cultural and architectural values.

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