OPEN DATA FOR CULTURAL HERITAGE

Place Based Digital Humanities
between representation, design and innovation

a cura di Daniele Villa

Una ricerca di Daniele Villa,
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con Elena Fontanella, Giorgio Limonta, Nausicaa Pezzoni,
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OD4CH | Farb 2015 DAStU/Politecnico di Milano

Planum Publisher

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Crediti

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Open Information on Andalusian Cultural Heritage

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Introduction

The Andalusian Institute for Historical Heritage (IAPH) is a publicly run enterprise of the Regional Ministry for Culture of the Andalusian regional government; its roles include cultural heritage research, documentation, conservation, restoration, dissemination and training.

The 1st General Plan for Cultural Assets (1989–1995), through which IAPH was established, highlighted the role of communication and intermediation that the institution had to play in Andalusian society. Since that time, IAPH has worked to document Andalusian cultural heritage through systematic standardisation and computerisation efforts by various bodies that produce heritage information (inventories, catalogues, research, etc.) and the implementation of its own projects to register new concepts of heritage, such as intangible, industrial or contemporary heritage or cultural landscapes.

One of IAPH's primary responsibilities is as a producer of knowledge about cultural heritage, strengthening the capacity to create value (in the broadest sense of the term), generating, circulating and managing it, with a view both to promoting its own capacities and to supporting other producers of knowledge in the field, whether they are public, private or civil society organisations. The Institute's certification as an Agent of the Andalusian System of Knowledge consolidates this work and strengthens its role as a provider of digital content on Andalusian cultural heritage, creating products and services to generate cultural, social and economic value.

In the area of documentation, IAPH's Documentation and Study Centre is responsible for the following lines of action:

- Analysis, study, development and dissemination of theories, methods and techniques applied to historical heritage documentation.
- Preparation of reports, diagnoses, plans and interventions in the area of cultural

asset documentation, providing specialised services.

- Contribution to the study and knowledge of cultural assets in Andalusia through the integration, coordination and systematisation of historical heritage information and documentation.

One of IAPH's values in the context of the generation, access and use of cultural heritage knowledge is the wide spectrum of focuses, views, visions and methodologies employed by its diverse team of specialists in addressing cultural heritage knowledge and the ever-growing predisposition to involve new social agents in identifying values, risks and opportunities to safeguard this knowledge, drawing on all the instruments available according to their abilities and duties. Success in this work will be simpler and more profitable with the greater participation of citizens as a whole and with improvements to access to information and the ability to make the information obtained openly available for reuse.

In this context and within the framework of an institutional policy to promote open access to information and documentation, improvements have been implemented both for heritage information management and dissemination tools and for the documentation of the Institute itself.

DIGITAL GUIDE TO CULTURAL HERITAGE

One of the current tools related to documentation and open access to IAPH's information is the Digital Guide to the Cultural Heritage of Andalusia (hereinafter, the Digital Guide).

The Digital Guide is the outcome of an extensive process by which the Documentation and Study Centre has adapted to the evolution of the concept of cultural heritage, extending its information systems and assets from the points of view of technology, cross-disciplinarity, focus, and information access and reuse by the general public. The Guide includes a series of information products which are managed for greater online impact and dissemination.

Information products

Since the 1990s, IAPH has generated several computer applications which have met the needs of cultural asset information management in parallel to the evolution of cultural heritage as a concept. This work began with the creation of databases of movable heritage and archaeological, ethnological and architectural immovable heritage, and a Thesaurus of Andalusian Historical Heritage, which serves as a common documentary language for all the databases. Later, the immovable heritage databases were integrated into Andalusian Historical Heritage Information System, which handled the information from all the databases and a GIS module for the generation and management of spatial information (LADRÓN DE GUEVARA and MUÑOZ, 2007). Design began in 2004 for the *Andalusian Cultural Asset Management and Information System* which also integrated information on intangible and movable heritage, as well as procedures for cultural heritage management and electronic administration. With the new system, IAPH is responsible for managing, validating and disseminating heritage information from the Regional Ministry of Culture's ensemble of central and peripheral services (ESCALONA, 2007).

The Digital Guide includes a range of content and applications and gives free ac-

cess to all heritage information compiled and/or generated by IAPH: descriptive information on movable, immovable, intangible and landscape heritage; digital cartography; images; multimedia products, cultural routes, electronic resources, etc.[1] Of the different applications making up the Digital Guide, accessible through the IAPH webpage, the following are particularly noteworthy:

1. Metasearch Engine.[2] Application which gathers together IAPH's various cultural heritage documentation and study applications and content under geographical criteria (province and municipality – interactive map).

2. Immovable Heritage database.[3] Online application for consultation of the Andalusian Cultural Asset Management and Information System, allowing simple or advanced searches combining diverse parameters (province, municipality, historical period, type, protection status, activities, ethnic groups, etc.). Includes basic information on over 26,000 heritage items, of which 54 % are archaeological, 28 % are architectural and 18 % are archaeological (Figure 1).

3. Movable Heritage database.[4] Includes information on a large, varied series of objects, including paintings, sculpture, retables and textile ensembles. It currently encompasses items dating from the Roman period to the most recent contemporary art pieces. Of the approximately 85,000 objects registered, the majority belong to the Baroque (42 %) and other contemporary styles (34 %) (Figure 2).

4. Intangible Heritage database.[5] The main information source is the Atlas of Andalusian Intangible Heritage, which contains a total of 1,753 registered assets. The cultural assets registered, which are representative, are grouped into four broad thematic categories or areas: festive rituals, trades and knowledge, forms of expression, and food and culinary systems (Figure 3).

5. Cultural Landscape Channel[6]. Includes all information related to Andalusia's landscapes of cultural interest and IAPH's projects and activities in this area (Figure 4).

6. Thesaurus of Historical Heritage.[7] The Thesaurus of Andalusian Historical Heritage (TPHA, for its Spanish initials) is the first resource to combine all disciplines related to historical heritage in a single documentary language, with over 16,000 standardised terms.

7. Cultural Heritage Locator.[8] This tool allows users to consult a selection of Andalusian cultural assets (slightly over 5,500) through cartographic visualisation. The aim of this is to provide a new service by which heritage information may be accessed according to its physical location. The remaining geographical infor-

1. More detailed information on each information product and the main IAPH projects that have generated digital content can be consulted at (IAPH, 2016).

2. http://www.iaph.es/web/canales/conoce-el-patrimonio/guia-digital/ [Accessed: 5/06/2017].

3. http://www.iaph.es/patrimonio-inmueble-andalucia/ [Accessed: 5/06/2017].

4. http://www.iaph.es/patrimonio-mueble-andalucia/ [Accessed: 5/06/2017].

5. http://www.iaph.es/patrimonio-inmaterial-andalucia/ [Accessed: 5/06/2017].

6. http://www.iaph.es/web/canales/patrimonio-cultural/paisaje-cultural-andalucia/?name=Downloads&d_op=viewdownload&cid=191&opcionMenu=bOtrosServicios0&orderby=title [Accessed: 5/06/2017].

7. http://www.iaph.es/web/canales/conoce-el-patrimonio/tesauro-pha/index.html [Accessed: 5/06/2017].

8. http://www.iaph.es/localizador-cartografico-patrimonio-cultural-andalucia/ [Accessed: 5/06/2017].

mation is available on a personalised basis from the Digital Cartography Service (Figure 4).

8. Cultural routes.[9] Uses the cultural route as a tool to raise awareness Andalusian cultural heritage from a holistic perspective, aiming to reflect the diversity o f examples (both tangible and intangible) that map our historical reality. Special attention is paid to the consideration of emergent forms of heritage, such as contemporary and intangible heritage and cultural landscapes.

9. Informational products.[10] IAPH has developed multimedia monographs and information files on different areas of Andalusia's cultural heritage.

The Digital Guide will be connected to IAPH's Digital Assets Repository to integrate bibliographic and visual information with the cultural assets registered in the Repository.

Management of information products

IAPH strives to provide excellent products by meeting the five requirements that every web application must include: usability, accessibility, compatibility, sociability and indexability.

• Usability is related to the simplicity of a system for users. The user must be able to control the process at all points during interaction with the system in order to avoid frustration and encourage loyalty.

• Accessibility refers to the democratisation of the use of products. Consultation of information must be a satisfactory experience for all users with physical or learning disabilities. The W3 Consortium, the most important institution in this field, has designed a series of accessibility guidelines and priorities through its WAI norms. The IAPH information products are rated WAI AA (there are three levels, A, AA and AAA).

• Compatibility is understood as the versatility of consultation using any type of device. In recent years, Spain has been a leader in the adoption of new technology, particularly in the use of smartphones as information access points. The fact of the Internet's increasingly mobile nature means it is vital for IAPH's content to be optimised for mobiles. According to data from the Telefónica Foundation's report on the Information Society in Spain in 2015, 85 % of Internet users in Andalusia access the Internet from mobile devices, putting Andalusia first in Europe for this trend.

• To speak of sociability is to speak of shared knowledge. Again referring to the Telefónica report, 347,000 tweets and 3.3 million Facebook status updates are published every minute in Spain. Generating quality content targeting different user profiles is crucial for any knowledge-based organisation, however this serves no purpose if social media are not used to boost the products' visibility and virality.

Finally, indexability is a decisive factor in search engine optimisation. IAPH's products represent strategic content from the point of view of visits and organic positioning.

9. http://www.iaph.es/web/canales/conoce-el-patrimonio/rutas-culturales/index.html [Accessed: 5/06/2017].
10. http://www.iaph.es/web/canales/conoce-el-patrimonio/productos_divulgativos/index.html [Accessed: 5/06/2017].

The main objectives IAPH aims to achieve for its information products are visibility, personalisation and competitiveness.

- Visibility: IAPH has implemented a range of digital marketing strategies using SEO (search engine optimisation) and SMO (social media optimisation) to improve the visibility of its information products. One of the foundations of digital marketing is the use of key words. The semantic field of keywords encompassing these products is immense; for this reason, IAPH has worked for years for each of these keywords to appear among the first results from the main search engines.
- Personalisation: this concerns aligning product content with current and future users' information needs. A highly useful tool for this is the analysis of the information behaviour of different profiles of user.
- Competitiveness: Making IAPH a leader in the field of cultural heritage products involves systematically observing the Institute's surroundings and implementing a cycle of continuous improvement, consolidating strengths and correcting for weaknesses.

Similarly, IAPH products undergo heuristic evaluation for usability, observing Jakob Nielsen's principles, as well as an accessibility audit which follows the guidelines of W3 Consortium. Search engine optimisation involves three key aspects:

- Consulting keywords; knowledge of sector keywords; analysis of other sites' keywords, keywords in internal searches.
- Indexability audit, with the objective of enabling the "spiders" used by search engines to scan the pages of the product in question.
- Relevance analysis. This analysis involves information architecture and the programming of pages and their content.

The final stages of the process are publication, management and evaluation. Good management is successful when a team takes on diverse tasks, from the editing and publication of content to IT maintenance, dissemination, monitoring and systematisation of evaluation data and the design of new proposals for improvement.

The evaluation stage is hugely important and merits additional attention. The process of evaluation measures a product's online impact Internet and reveals its strengths and weaknesses, making it an essential step in decision-making. IAPH has for years been monitoring its products using a series of performance indicators, which has been expanded over time as needs have been detected (visits, geographical location of visitors, sources of traffic, type of visitor, indexability, crawl frequency, length of visit, bounce rates, most visited content, most linked content, inbound links, keywords, mobile traffic, etc.).

To summarise, to take the most strategic aspects of the entire IAPH information product creation process and translate them into keywords, these would be:

- KNOWLEDGE of everything surrounding a user during the process of searching for and consuming information
- VISIBILITY of products with large doses of digital marketing
- LOYALTY of users. A satisfied user comes back
- INTERNATIONALISATION of content
- IMPROVEMENT through observation, evaluation and action

IAPH DIGITAL ASSETS REPOSITORY (ReA)

The purpose of the Digital Assets Repository (ReA, for its Spanish abbreviation) is to manage and disseminate the IAPH image archives, the scientific output of the Institute's technical staff and the technical documentation produced during its projects and activities in the areas of research and innovation, documentation, intervention, communication and dissemination of cultural heritage. This initiative is a continuation of the work started by IAPH in 1991 to transfer knowledge about Andalusian cultural heritage to the general public, which has taken the form of the Digital Guide. The content of the ReA has been structured into communities: technical documentation, image archive and scientific output.

- Technical documentation. This includes protocols, technical recommendations, reports, diagnostics, institutional documents and other unpublished technical documents from IAPH projects and actions.
- Image archive. The IAPH image archive contains over 70,000 cultural heritage images, made available to the public, of the over 160,000 managed by the Institute (Figure 4).
- Scientific output. This covers scientific and research papers published by employees of IAPH.

The ReA was developed using the *DSpace* free software, following the Dublin Core Metadata standard, which enables interoperability and increases the possibilities of information generated by IAPH being reused. An example of this is its relationships with other national and international repositories, such as Hispana and Europeana.

To summarise, the IAPH Digital Assets Repository offers:

- A centre offering free access to IAPH's information on Andalusian cultural heritage and the assets that constitute this heritage.
- A digital archive for the long-term preservation of any type and format of document, with each document being assigned a permanent uniform resource identifier (URI).
- A search engine, providing information on the different characteristics (bibliography, images, technical reports, etc.) of a single cultural asset or geographical area.
- A collection of scientific material that cannot be found through the ordinary channels, produced as part of IAPH's activities.
- A tool to facilitate the publication of IAPH staff's scientific papers, boosting their visibility in search engine results.
- Dissemination of Andalusian scientific output on the region's cultural heritage in national and international search engines and aggregators such as Google Scholar, Hispana and Europeana.

USE OF HERITAGE INFORMATION

Evaluating usage of the information contained in the Digital Guide is a complex and somewhat imprecise process, as the information is freely available online without any requirement for users to give their identities or the purposes for which they require the information. To address this difficulty as far as possible, the segmented information from IAPH's personalised cultural asset information and digital cartography

services was used in order subsequently to study possible parallels with the usage of the information in diverse documents and web pages related to cultural heritage management, research, education and dissemination.

Heritage management

Heritage information is used by public authorities in general to support decision-making in all areas involved with cultural heritage management.

In this case, analysis was run on data extracted from IAPH's information and digital cartography services, and references made to that information in urban and land use planning documents.

In 2016, a total of 209 personalised applications for information were received, of which 12.5 % were made by public authorities. Likewise, 32.5 % of the applications came from businesses or professionals and were linked to a range of purposes, including environmental impact assessments and the preparation of land use or urban planning documents. The same year, 990,361 visits were registered to the Digital Guide through the Internet; extrapolating the percentages for the personalised services, it can be concluded that over 400,000 of the visits may be associated to searches by public authorities, companies and professionals involved in heritage management. Land use and urban planning documents, protection instruments and land works planning documents usually involve an analysis and/or a catalogue giving some level of detail on the cultural heritage of the municipalities affected. Consultations of information in the Digital Guide for this purpose are increasing, as the data shows:

a) Urban planning: A randomly selected sample was analysed, comprising 112 plans (14 for each of the 8 provinces of Andalusia) approved or revised since 2000, when IAPH started disseminating heritage information online. Of these, 49 % cited databases in the Digital Guide as a source of information. To verify the progressive increase in consultations of IAPH information for the preparation of urban planning documents, the plans were divided into two groups: those approved/revised in 2000-2009 (60 plans) and in 2010–2015 (52 plans). Of the plans in the first-time bracket, 38 % used information from the Digital Guide, while 62 % of the more recent set of 52 plans used the resource.

b) Land use planning: Analysis was run of land use plans for the Natural Parks of Andalusia (PORN and PRUG), with the findings being that 52 % of these expressly cite some product in the Digital Guide as an information source. This percentage remains constant over time, with no significant increase or decrease being observed.

Heritage research

According to the personalised information services mentioned above, 35 % of applications made in 2016 were from researchers or university students. Using the same extrapolation described above, we can assume that around 350,000 visits to the online databases that year were for the same purpose.

An exhaustive Google Scholar search was carried out for publications citing any of the databases of the Digital Guide in their research framework; these were grouped into two blocks: papers referring to the information system itself, and papers using

the content of the databases for contextual information (FERNÁNDEZ et al., 2016: 47 et seq.). As Figure 5 shows, both groups show a gradual increase in references, leading to the conclusion that the Digital Guide is becoming better known and used among this user group.

Similarly, the Digital Guide is recommended in diverse teaching programmes of university courses and resource guides to support researchers at the universities of Seville, Córdoba and Jaén (FERNÁNDEZ, 2016: 18–19).

Cultural heritage dissemination

Through IAPH, the Regional Government of Andalusia offers the public the greatest volume of open-access cultural heritage content, with the greatest diversity (images, maps, cultural routes, descriptive data, etc.) and the most filtering options. It receives close to a million visits; Figure 5 shows the trend in the number of visits. The latest available online impact analysis for this information concludes that (FERNÁNDEZ et al., 2016: 26 et seq.):

- Information in the Digital Guide is consulted from 40 % of all countries worldwide, particularly from Europe (25 countries), Latin America and the Caribbean (21 countries) and Asia (13 countries).
- Within Spain, consultations originate in every Autonomous Community and province, with particularly large volumes of traffic originating from Madrid, Navarre and Catalonia. The highest number of visits from within Andalusia are from Seville, Granada and Córdoba.
- The Digital Guide database which receives the most visits is the BDI (Immovable Assets Database); this is also the database with the most balanced number of new and returning users, at 47.7 % and 52.3 %, respectively.
- In 2016, 4,383 domains linked to the Digital Guide, demonstrating the popularity of the resource and the increasing use made of it.

OPEN DATA FOR CULTURAL HERITAGE

IAPH is undergoing a process of public sector modernisation brought about by the emergence of a new social and economic reality in which knowledge is managed and accessed through a new model of connection to citizens.

Due to their roles as producers of information for public use and as providers of a service, public organisations are obliged to adhere to the requirements imposed by a knowledge economy in which information access takes on the role of a structural condition for citizens to exercise their democratic rights. For no small reason, knowledge is public organisations' main asset, and the information they produce is particularly useful for citizens due to certain characteristics: quality, reliability and completeness.

In Spain, official information suggests that open data has an economic impact of 1.7 billion euros and is the impulse behind the creation of over 13,000 jobs.[11] Public authorities are responsible for a significant proportion of the open data which is

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11. http://www.europapress.es/economia/noticia-sector-datos-abiertos-tiene-impacto-economico-directo-1700-millones-espana-20161002101457.html [Accessed: 4/06/2017].

published. Spain is one of the leading producers of open data in Europe.[12]

IAPH is familiar with this trend and strives to be an open, flexible, interconnected organisation which focuses on operating as part of a network where citizens, businesses and public bodies exchange knowledge and develop services through new ways of interacting and communicating.

To this end, one of IAPH's strategies is to begin the process of making heritage information available publicly for reuse. The first specific action implemented as part of this was the Digital Assets Repository. The process will culminate in the data of the Digital Guide to the Cultural Heritage of Andalusia being made open; this is currently underway in the form of a competitive project funded by the Andalusian Regional Ministry for the Economy and Knowledge.

This public availability of the Digital Guide will enable citizens to reuse the information assets generated during IAPH's 25-year history. The Digital Guide is therefore a strategic public resource with great potential to create economic growth and employment, promoting the principles of transparency, such as participation and collaboration.

The Digital Guide will enable IAPH to begin its journey along the path of the Semantic Web as part of the Linked Open Data paradigm, aspiring to achieve a 5-star LOD rating. The data in the Digital Guide will be available under an open access licence; structured; available in non-proprietary formats; will follow the W3C open data standards; and will be linked.

IAPH applies the following premises to achieve an effective process of information being made available to the public and reused:

- Resources: IAPH allocates human resources to generate and qualify heritage material. Similarly, it dedicates economic, technical and legal resources for information publishing to the process of making the Guide available to the public.
- Commitment: IAPH is committed to systematically updating its open-access information.
- Usage information: IAPH will analyse how the open-access information is adapted to different uses by different types of user.
- Integration: IAPH will provide services and tools for the integration of the information in infomediaries' systems and applications.
- Ecosystem: IAPH will promote interaction between different agents reusing the information.
- Usefulness: IAPH will work to make the information available to the largest possible number of infomediaries.
- Semantics: IAPH provides the community the material needed to understand the process of public information reuse.

In Andalusia, IAPH will become the leading producer of open-access heritage information, due to the scarcity of open datasets on cultural heritage that are available to the public. The Andalusian Open Data portal offers 225 open datasets, of which only 10 are related to culture and sport.

At the national level, the Spanish open Data portal offers citizens 14,617 datasets. Data related to cultural heritage is available in the *Culture and leisure* category, which

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12 <https://retina.elpais.com/retina/2017/05/26/tendencias/1495812416_619775.html> [Accessed: 4/06/2017]

contains 994 accessible datasets. Nineteen of these are directly related to cultural heritage, with the Basque Country, Aragón and Catalonia being the main providers. In terms of the use of open-access data, the high level of specificity and qualification of the information generated by IAPH mean it has high potential in the development of applications targeting both the general public and smart cities, as well as targeting more research-based profiles. The Digital Guide will, then, become an open, structured system of knowledge, based on the principles of collaboration, transparency and participation, which will promote interoperability and open innovation with the creation of new business models based on new products and services.

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