

# The Project of the Italian Culture Portal and its Development - A Case Study: Designing a Dublin Core Application Profile for Interoperability and Open Distribution of Cultural Contents

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## Abstract

In September 2004 the Italian Ministry of Cultural Heritage and Activities (MiBAC) committed to Scuola Normale Superiore di Pisa (SNS) the scientific and technical project for the Italian Culture Portal. The project was delivered during 2005, together with a prototype which had the function to verify and test the project's issues and has been provided as reference for the implementation. In 2006 MiBAC selected, through a public competition, the IT company Reply for developing the Portal and Electa Napoli for providing the editorial office and plan. The Portal is now under development and will be delivered during 2007. SNS is presently working as consultant of MiBAC to give support to the whole staff employed in the fulfilment of the Portal and to help in the difficult activity of the mapping of various resources to be harvested and published in the Portal. This paper illustrates the project of the Italian Culture Portal delivered by SNS, describing in particular the solutions adopted for guaranteeing the interoperability, accessibility and usability tasks. One of the main objectives of the Portal is to offer open access to information on the "Italian Culture", which is a wide, evolving concept comprehensive of tangible and un-tangible cultural patrimony. Resources pertaining to this vast and complex domain are therefore of very different kinds and formats, moreover, they are codified following different schemas. For guaranteeing the interoperability among such cultural resources, a Dublin Core Application Profile has been specifically designed for the Portal. An official publication of this AP is currently under development: it has been recently refined and improved on the basis of the first mapping experiences and is anticipated in this contribute in this updated form.

**Keywords:** open access; interoperability; metadata standards; application profile

## 1 Introduction

The scientific and technical project for the Italian Culture Portal was promoted by the Italian Ministry of Cultural Heritage and Activities (MiBAC) and delivered by Scuola Normale Superiore di Pisa (SNS) during 2005 [1]. At the moment SNS is working as a consultant for MiBAC to flank the company which is carrying out the Portal, which will be named "CulturaItalia".

The main mission of the Italian Culture Portal is to communicate to different kinds of users the whole ensemble of Italian culture, as a media conceived for the diffusion of knowledge, promotion and enhancement of cultural heritage. Thus, CulturaItalia will offer access to the existing resources on cultural contents and will give more exposure to the vast amount of websites pertaining to museums, libraries, archives, universities and other research institutions: users will access resources stored in various repositories browsing by subjects, places, people and time. It will be possible to visualise information from the resources and to further deepen the knowledge directly reaching the websites of each institution.

The Portal will harvest metadata from different repositories and will export metadata to other national and international Portals. It will also provide contents created and managed by an editorial office, to offer updated news on the main cultural events and to provide thematic itineraries for a guided navigation through the harvested contents.

Resources originating from various data-sources will remain under the control of institutions responsible for their creation, approval, management and maintenance: data will not be duplicated into the Portal's repository and will be retrievable through a unified and interoperable system.

In order to guarantee the interoperability of various kinds of cultural resources and to allow retrieval and indexing functions on their contents, a specific Dublin Core Application Profile has been designed on the basis of the complex domain of “Italian Culture”. The PICO AP (so called from the Project’s acronym) [2], which will be exposed in this paper, has been currently reviewed and improved according to the first mapping experiences made by SNS on some repositories, whose contents have been chosen to be harvested by CulturalItalia. The PICO AP will be soon published on a PURL (Persistent Uniform Resource Locator) [3].

## 2 Methodology

The project for CulturalItalia has been developed through the following steps:

- users and domain analysis
- definition of user scenarios and use cases
- overall architecture design
- content analysis
- analysis of the state of the art on descriptive metadata standards
- design of the metadata schema (PICO AP)
- design of the user interface
- project prototype

The identification of potential users of the Portal moved from the requirements issued by MiBAC, which pointed out that the Culture Portal should be distinguishable in its domain and functionalities both from the official web site of MiBAC [4], oriented to people in charge of management and preservation of Cultural Heritage, and from the Portal for Italian Tourism.

Moreover, potential addressees of a cultural portal have been identified with the analysis of some of the most important European and international portals (e.g. French [www.culture.fr](http://www.culture.fr), British <http://www.24hourmuseum.org.uk/>), websites of cultural institutions such as museums, theatres, universities, etc.

Eight user scenarios have been written, describing eight different approaches to the Portal, by different kind of users. Scenarios described the following users and functionalities:

- Foreign tourist: language selection, access from the map, browsing and e-booking;
- General user: disambiguation of query results, use of contents suggested by the editorial staff and linked to results of user’s query;
- Italian teacher with partial visual deficit: accessible set up, simple and advanced search, registration to the Portal, submission of a comment to the editorial staff;
- Foreign researcher: free and advanced search, access to the web site identified through the Portal;
- Journalist: search amongst cultural events, purchase of printable pictures, registration, download;
- Publishing house: search amongst images, contact for banner exchange;
- Tourists with motion deficit: browsing from place and events, visualization on the map, participation to forum;
- Italian high school student: simple search, print function and e-commerce tools.

Adopting UML (Unified Modelling Language), such descriptive scenarios have been transformed in use cases diagrams, which identified:

- Actors, human (different final users both of the front end and of the back office) and IT components;
- inter-actions between actors and the system from the first query to the final result.

UML has been useful also to improve cooperation in a staff composed by IT developers as well as cultural domain experts, overcoming the gap of different languages. On the basis of main functionalities identified by the user requirements, the core components of the System Architecture have been designed; as the project should be used as a -non mandatory- feasibility study for the final development, costs and benefits of some existing systems and components have been considered.

Moving from the analysis of the contents foreseen for the Portal, the best solution has been identified in an harvesting procedure. A study of the state of the art collected different metadata standards and categories for describing cultural resources, such as Dublin Core, VRA -Visual Resources Association, CDWA- Categories for

the Description of Works of Art, CIMI core set, EAD- Encoded Archival Description, MARC- Machine-Readable Cataloguing format, CIDOC-CRM, etc. Moreover, most relevant thesauri (from UNESCO to ULAN and AAT) concerning cultural domain, have been taken into consideration. This analysis served to decide to adopt a specific DC application profile, which will be in depth described later. Finally the user interface has been designed, specially focussing on the functionalities of searching and browsing.

The Portal is currently under development. Reply S.p.A. is developing the technical system. The editorial staff, under MiBAC supervision, is preparing contents and identifying new providers. SNS is flanking MiBAC in testing functionalities and interfaces of the system, and works as consultant for identifying new content providers and data sources, analysing the data models adopted by each provider, defining mappings to the PICO AP, monitoring and improving results of harvesting procedures.

### 3 Analysis: Users' Identification, Mission and Domain

The project is based on the analysis and definition of the expected users' target, consequently on the identification of users' needs and requirements, of the mission of the Portal and of its domain, which necessarily corresponds to the domain of Italian Culture. The target of the Portal will be Italian and foreign users, such as:

- tourists and people interested in, and passionate of, culture
- business users (publishers, merchandising, etc.)
- young people, from primary to high school
- culture professionals such as scholars, museums curators, researchers, etc.

Special contents and services will be created for each kind of user. It is important to notice that each user can be a person with physical or cognitive disabilities: the Portal must be accessible also for those categories. The mission of CulturalItalia identifies the following goals:

- To promote Italian culture and heritage in Italy and abroad:
  - to integrate Italian culture in the international contest;
  - to attract web users toward cultural themes;
  - to give visibility to Italian cultural institutions;
  - to support activities and projects focused on culture;
  - to integrate cooperation between public and private institutions.
- To promote and integrate existing resources:
  - to offer an index of Italian cultural resources and heritage;
  - to create flexible and scalable relations between resources;
  - to identify existing digital resources, websites, databases, digital libraries;
  - to allow interoperable queries on indexed subjects, places, events, and people.

The Domain of "Italian Culture" is a wide concept, conceived in different ways. MiBAC is responsible for preservation, management, research and exploitation of the Italian cultural patrimony, which is composed by:

- Tangible heritage:
  - architectural and environmental objects;
  - artworks and collections;
  - manuscripts, edited books and the current literature;
  - archaeological and demo-ethno-anthropological objects;
  - contemporary art and architecture.
- Un-tangible heritage:
  - music;
  - dance and theatre, circuses and street performances;
  - cinema;
  - humanities;
  - scientific culture.

## 4 Harvesting of Contents

CulturaItalia will give integrated access for information pertaining to the domain of “Italian Culture”, as it has been defined in the previous chapter. Resources coming from various data-sources will not be duplicated into the Portal’s repository. On the contrary, it will offer an index of those contents by harvesting metadata pertaining to their data.

Before being harvested, metadata will be mapped into one metadata schema, which will permit the indexing, browse and query functions on the whole ensemble of harvested contents. Metadata will be harvested using OAI-PMH [5]. This protocol allows the metadata migration from content providers to one or more harvesters, adding services as indexing system or automatic classification. OAI-PMH uses HTTP protocol for data transfer and XML for data coding.

Each institution responsible for contents to be harvested will establish, together with MiBAC, which data will be accessible from the Portal, as some resources or part of them could contain confidential information that shouldn’t be published.

## 5 The PICO DC Application Profile

Contents coming from external data-sources will be imported in the Portal through the harvesting of metadata and the mapping in one metadata schema. As the Portal will join different kinds of contents, it seemed unsuitable to use a data model with predefined entity types. For guaranteeing system’s scalability, a flexible solution has been preferred, which consists in the designing of a unique metadata schema: to respect world wide used standards, the Italian Culture Portal will adopt a metadata set based on DC (Dublin Core) standard [6].

This standard is very used because it consists in one scheme that can be applied to every kind of resource, distinguished by the element <dc:Type>. Anyway, it is not really efficient for cultural resources because, as the DC Element Set (the so called ‘Simple DC’) is very restricted, many different information must be grouped into one element [7]. For this reason, in the last years Dublin Core Metadata Initiative (DCMI) divulged the ‘Qualified DC’ schema, which refines DC Element Set using Element Refinements and supporting Encoding Schemes, to attribute to a given property the value selected from a controlled vocabulary, a thesaurus, or an ontology [8].

Thanks to Dumbing Down algorithms, now developed in XML, in the data sharing with a system that supports Simple DC, it is possible to reduce Qualified DC values into Simple DC values. With this process, there is a minimum loss of information and more possibility to obtain a significant retrieval. At the same time, interoperability between repositories based on Dublin Core is assured.

DCMI suggests to institutions and research groups to develop DC Application Profiles for specific applications and domains, designing schemas which can join:

- All, or a selection of, DC Elements and Refinements;
- Elements from one or more element sets;
- Elements from locally defined sets [9].

A DC Application Profile has been designed for the Portal of Italian Culture on the basis of recommendations, documents and samples published by DCMI, in order to define further extensions specially conceived to retrieve information pertaining to Italian culture. This application profile could be further expanded for harvesting eventually unexpected contents in the future, by adding Refinements and Encoding Schemes that could be necessary for data retrieval.

The PICO AP has been designed by I. Buonazia, M. E. Masci and D. Merlitti (SNS working group on metadata, supervised by U. Parrini). It has been recently improved on the basis of the first mappings performed on some data-models or metadata schemas related to contents to be harvested by CulturaItalia. An official publication is currently under development. It will be edited on a PURL, following the DC AP Guidelines [10]. This DC Application Profile joins in one metadata schema:

- All DC Elements;
- All DC Element Refinements and Encoding Schemes from the Qualified DC;
- other refinements and encoding schemes specifically conceived for the CulturaItalia domain.

Therefore, the following namespaces are included into this metadata schema: ‘dc:’, ‘dcterms:’, ‘pico:’. In the following sections the additional extensions and qualifiers of PICO AP to the Qualified DC are exposed in detail.

## 5.1 Extensions to DCMI Type Vocabulary

The resource’s type has been further extended with the PICO Type Vocabulary, which joins the types ‘Corporate Body’, ‘Physical Person’ and ‘Project’, to the types foreseen in the DCMI Type Vocabulary [11].

## 5.2 Qualifiers Added to the Qualified DC Element Refinements and Encoding Schemes in the PICO AP

In the following table are resumed the Element Refinements and Encoding schemes added in PICO AP to the Qualified DC: all DC qualifiers are implicitly included in the AP. In the right column qualifiers added by the PICO AP are specified for each DC Element, indicated in the left column.

DC ELEMENTS	PICO AP QUALIFIERS
dc:creator	label= Author definition= Any living or dead physical person, any corporate body and institution, responsible for the creation of a resource. It can be a writer, a painter, an architect, a musician, a photographer, a collector (as the author of the collection). comments= It is recommended to use Author instead of Creator when the creator of the resource can be mentioned with a proper name. type= element-refinement
	label= Commissioner definition= Any living or dead physical person, corporate body and institution, responsible for the commission, the order and/or the funding of the design of a resource. type= element-refinement
	label= ULAN - Union List of Artist Names definition = Controlled vocabulary by The Getty Research Institute. Reference at: <a href="http://www.getty.edu/research/conducting_research/vocabularies/ulan/">http://www.getty.edu/research/conducting_research/vocabularies/ulan/</a> . comments= It is recommended to use DCSV syntax for expressing ULAN values. For the name, indicate the ‘Preferred Name’. For the value, use the ID code assigned by ULAN. E.g. name=Cerquozzi, Michelangelo; value=500007713. type= encoding scheme
dc:subject	label= Theaurus PICO definition= Thesaurus composed by hierarchically structured keywords for indicating the topic of all the resources included into CulturalItalia. This ontology includes terms for assigning the resources to the index and to the themes menu of the Portal. type= encoding scheme
	label= UNESCO Thesaurus definition= Thesaurus for indicating the topic of resources on education, culture, natural, human and social sciences, communication and information. Multilingual: English, French, Spanish. Reference at: <a href="http://databases.unesco.org/thesaurus/">http://databases.unesco.org/thesaurus/</a> . type= encoding scheme
	label= AAT (Art and Architecture Thesaurus) definition= Thesaurus defined by Getty Research Institute for indicating the topic of resources pertaining to art and architecture objects. Reference at: <a href="http://www.getty.edu/research/conducting_research/vocabularies/aat/">http://www.getty.edu/research/conducting_research/vocabularies/aat/</a> . comments= It is recommended to use DCSV syntax for expressing AAT values. For the name, indicate the ‘Preferred Name’. For the value, use the ID code assigned by AAT. E.g. name=doric; value=300020111. type= encoding scheme
	label= ICONCLASS definition= Taxonomy of the iconographic subjects for the Western Art, from Medieval to the Contemporary Art. Multilingual: English, German, Italian, French, Finnish. Reference at: <a href="http://www.iconclass.nl">www.iconclass.nl</a> . comments= It is recommended to use DCSV syntax for expressing ICONCLASS values. For

DC ELEMENTS	PICO AP QUALIFIERS
	the name, indicate the subject name, for the value, use the related code. E.g. name=angels fighting against other evil powers; value=11G34. type= encoding scheme
dc:description	<p>label= Information definition= Information about the resource, as opening and closing ours. comments= It is generally used for resources with type: CorporateBody. type= element-refinement</p> <p>label= Contact definition= Information about contacts related to the resource. comments= Examples of Contact include: telephone number, fax, address, e-mail address, etc. It can't be used for indicating contacts of people which contribute to the resource. type= element-refinement</p> <p>label= Services definition= Services offered by the resource. E.g. cafeteria or restaurant services, services for unpaired people, laboratories and activities, extra. comments= It is generally used for resources with type: CorporateBody. type= element-refinement</p>
dc:publisher	<p>label= Distributor definition= Any living or dead physical person, any corporate body and institution, responsible for the distribution of an edited or published resource. comments= The usage of this term is recommended for resources as musical records and films. type= element-refinement</p> <p>label= Printer definition= Any living or dead physical person, any corporate body and institution, responsible for the print of an edited or published resource. This term comprehends both printers of physical (books, journals, images, etc.) and digital (CD, DVD, etc.) resources. type= element-refinement</p>
dc:contributor	<p>label= Editor definition= Any living or dead physical person, any corporate body and institution, responsible for the making, editing or organisation of the resource. E.g. the editor of a volume of proceedings or of an exhibition. comments= The usage of this term is recommended for resources with type: Text or Event. type= element-refinement</p> <p>label= Performer definition= Any living or dead physical person, which contributes to the execution of the resource by acting a performance, with reference to some entertaining events in particular. E.g. an actor, dancer, singer, musician, etc. type=element-refinement</p> <p>label= Producer definition= Any living or dead physical person, any corporate body and institution, responsible for the artistic and/or economic production of the resource. This term is used for producers of cinema, music, theatre, etc. type= element-refinement</p> <p>label= Responsible definition= Any living or dead physical person, any corporate body and institution, responsible for the management, organisation, administration, etc. of the resource or of a part of it. In some cases it coincides with the contact person, whose contacts are indicated for people who are looking for information about the resource. E.g. the responsible of a project or of one of its work packages, a museum director, the director of a university or of a department, etc. comments= For resources catalogued following ICCD (Central Institute for the Catalogue and the Documentation – Italy) schema, it indicates the cataloguing responsible. type= element-refinement</p> <p>label= Translator definition= Any living or dead physical person who made the translation of the resource type= element-refinement</p>

DC ELEMENTS	PICO AP QUALIFIERS
	label= ULAN - Union List of Artist Names (see above, under dc:creator)
dc:type	<p>label= PICO Type Vocabulary  definition= Controlled vocabulary which includes some resource types specifically conceived for the Italian Culture Portal domain: Corporate Body, Physical Person, Project. Those types are not foreseen by the DCMI Type Vocabulary.  type= encoding scheme</p> <p>label= CDType - Collection Description Type Vocabulary  definedBy= <a href="http://purl.org/cld/terms/">http://purl.org/cld/terms/</a>  definition= A list of types that categorize a collection.  comments= Reference at: <a href="http://www.ukoln.ac.uk/metadata/dcml/collection-application-profile/#cldCLDT">http://www.ukoln.ac.uk/metadata/dcml/collection-application-profile/#cldCLDT</a>  type= encoding scheme</p>
dc:format	label= Material And Technique definition= The material of the object and of its support and the technique of execution of a resource with type: PhysicalObject type= element-refinement
dc:identifier	<p>label= ISBN - International Standard Book Number  definition= The International Standard Book Number is an uniform and persistent identifier for a given title or for the edition of a title pertaining to a given publisher. Reference at: <a href="http://www.isbn.it/">http://www.isbn.it/</a>.  comments= It is generally used for resources with type: Text.  type= encoding scheme</p> <p>label= ISSN - International Standard Serial Number  definition= The International Standard Serial Number is the international identifier for serial publications such as printed or digital newspapers and periodicals. Reference at: <a href="http://www.issn.org/">http://www.issn.org/</a>.  comments= It is generally used for resources with type: Text.  type= encoding scheme</p>
dc:relation	<p>label= Preview  definition= Any form of abstract, reduction, image, video streaming used as anticipation of the resource.  type= element-refinement</p> <p>label= Promotes  definition= The described resource promotes and/or organizes the referenced resource.  type= element-refinement</p> <p>label= is Promoted By  definition= The described resource is promoted and/or organized by the referenced resource.  type= element-refinement</p> <p>label= Manages  definition= The described resource manages with different responsibilities (scientific, administrative, technical, etc.) the referenced resource.  type= element-refinement</p> <p>label= Is Managed By  definition= The described resource is managed with different responsibilities (scientific, administrative, technical, etc.) by the referenced resource.  type= element-refinement</p> <p>label= Is Owner Of  definition= The described resource owns the referenced resource.  type= element-refinement</p> <p>label= Is Owned By  definition= The described resource is owned by the referenced resource.  type= element-refinement</p> <p>label= Produces  definition= The described resource produces in its physical, or administrative, or any other issue, the referenced resource.</p>

DC ELEMENTS	PICO AP QUALIFIERS
	<p>comments= It is recommended to express value as URI. This relation should be used when it is possible to point at another resource, pertaining to the work produced by the described resource. type= element-refinement</p>
	<p>label= Is Produced By definition= The described resource is produced in its physical, or administrative, or any other issue, by the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point at another resource pertaining to who produced the described resource; otherwise it is recommended to use Producer. type= element-refinement</p>
	<p>label= Performs definition= The described resource performs, directly participating (e.g. as actor or musician) to, the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point at another resource pertaining to the work performed by the described resource. type= element-refinement</p>
	<p>label= Is Perfomed By definition= The described resource is performed by the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point to another resource, pertaining to who performs the described resource; otherwise it is recommended to use Performer. type= element-refinement</p>
	<p>label= Is Responsible For definition= The described resource is anyhow responsible for, or is the contact person of, the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point to another resource, the described resource is responsible for. type= element-refinement.</p>
	<p>label= Has As Responsible definition= The described resource has as responsible and/or contact person the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point at another resource, pertaining to who is responsible for the described resource. Otherwise it is recommended to use Responsible. type= element-refinement</p>
	<p>label= Contributes To definition= The described resource contributes anyhow to the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point at another resource, pertaining to something/someone that receives contributions from the described resource. type= element-refinement</p>
	<p>label= Has As Contributor definition= The described resource is produced, managed, organized with the contribution of the referenced resource. comments= It is recommended to express value as URI. This relation should be used when it is possible to point at another resource, pertaining to something/someone that is giving contributions to the described resource. Otherwise it is recommended to use Contributor. type= element-refinement</p>
	<p>label= Digitises definition= The described resource is responsible of the digitisation of the referenced resource. comments= It is recommended to express the value as URI. This relation is generally used for resources with type: Physical Person or Corporate Body. type= element-refinement</p>
	<p>label= Is Digitised By</p>

DC ELEMENTS	PICO AP QUALIFIERS
	definition= The described resource is digitised by the referenced resource. type= element-refinement label= Anchor definition= Reference to the URL of the web-page publishing the resource described by the metadata record. comments= It is recommended to use DCSV syntax as follows: title= e.g. Website of the Scuola Normale Superiore of Pisa; URL=http://www.sns.it type= encoding scheme
dc:coverage	label=Date of Birth definition= Date of Birth pertaining to resources with type: Physical Person. type=element-refinement
	label= Date of Death definition= Date of Death pertaining to resources with type: Physical Person. type= element-refinement
	label= Place of Birth definition= Place of Birth pertaining to resources with type: Physical Person. type= element-refinement
	label= Place of Death definition= Place of Death pertaining to resources with type: Physical Person. type= element-refinement
	label= ISTAT Code definition= Code assigned by Istituto Nazionale di Statistica italiano (Italian National Institute for Statistics), which identifies inhabited places in the Italian territory. Reference at <a href="http://www.istat.it/strumenti/definizioni/comuni/">http://www.istat.it/strumenti/definizioni/comuni/</a> comments= ISTAT code must be composed by 8 numbers: first 2 identify the Region; following 3 identify Province; final 3 identify the City (o smaller inhabited place) within the Province. type=encoding scheme
	label= Postal Address definition= Postal address of a resource with type: Physical Object or Corporate Body. It is expressed with the DCSV syntax as specified in the following example: PlaceType=Via /piazza / Largo, etc.; PlaceName=Dante; PlaceNumber=26; ZipCode - CAP=57124; City=Roma; Province=RM; Region=Lazio; Country=Italia. type=encoding scheme

## 6 User Interface

*CulturaItalia* will publish different kinds of contents:

- static contents: Head and logo, access to multilingual versions, credits, contact information, mission, site map, copyright;
- dynamic contents, from CMS: news, itineraries, focus, press release, forum, FAQ, newsletter, specific areas (e.g.: young users);
- dynamic contents, from harvesting: metadata harvested from external repositories;
- business logic contents, depending on the user session: search results, bookmarks, etc.;
- user inputs: layout personalization controls (font, contrast, colour), registration area to access in a private area to save bookmarks, annotate events in agenda, etc.

The interface will allow data retrieval on those contents through different possibilities for searching and browsing. User will access contents through three kinds of searches:

- free search: user composes one or more words, using Boolean syntax;
- advanced search: user refines the query in the catalogue, selecting if the item to be retrieved is “place”, “person”, “event”, or “object”;
- geographic search, selecting a place on a list or on a map related to a GIS system.

It will be possible to browse the catalogue through the Main Menu or the Theme Menu. According to the 4 High Level Elements of DC Culture, defined by Aquarel project and approved by MINERVA project, the Main Menu of the catalogue is structured in:

- Who: people, institutions, administration offices, museums, archives, libraries, universities, etc.;
- What: art objects, monuments, documents, books, photos, movies, records, theatre and music productions, etc.;
- When: contents retrievable through temporal periods;
- Where: browse by region, province, town, on a controlled list or directly on a GIS.

User will browse the catalogue using a ‘facettes’ system: he can start the query from one of the four elements and further refine the results range. A simplified alternative for browsing is the Themes menu. It groups the resources according to the following arguments: Archaeology, Architecture, Visual Arts, Environment and Landscape, Cinema and Media, Music, Entertainment, Traditions, Humanities, Scientific Culture, Education and Research, Libraries, Literature, Archives, Museums, Exhibitions.

The Portal will not publish only resources harvested from external repositories, but will produce also new contents: an editorial office will prepare and manage contents to provide interesting relations between resources and make the user discover them through links among different kinds of information. Those new contents will be tailored on different users’ targets and will be distributed into the following sections of the Portal:

- Itineraries: articles focused on a theme, aimed at suggesting a virtual tour through some resources selected from the catalogue;
- Focuses: short monographs on a single argument;
- Events: information on cultural events (exhibitions, concerts, theatre, conferences);
- News: selected news on Italian culture.

Finally the project recommends that the Portal would provide the following services, to be eventually implemented in a later phase after the first realization:

- Multilingual versions;
- Newsletter;
- Forum;
- Young users area.

## 7 Recommendations for Usability and Accessibility

The project for the Italian Culture Portal deals with recommendations both for usability and for accessibility by impaired people. The Portal, which will be maintained by a public institution, must be usable by impaired people, e.g. by people with visual, auditive, motion and cognitive deficit, through the use of assistive devices and technologies.

In Italy such recommendation is ruled by the law n. 4 issued on 2004/01/09, “Disposizioni per favorire l’accesso dei soggetti disabili agli strumenti informatici” [12] (Recommendations for favouring access to IT tools by impaired people). This law imposes specific obligations both for the purchase of goods and for the providing of services, even with the possibility of making the service void.

The abovementioned law refers to the Italian Constitution (art. 3 "Every citizen has equal social dignity and is equal for the law, without distinctions of [...] personal and social conditions. It is duty of the Republic to remove economic and social impediments which [...] prevent the full development of the human being and the complete participation to the political, economical and social organization of the State.") and to norms issued by the Ministry of Public Administration (Ministero della Funzione Pubblica) and by the AIPA – Authority for IT in Public Administration, often ignored.

The law, together with recommendations for technical requirements for hardware (e.g. keyboards, devices for remote control) and software (e.g. user interface, maintenance of set up defined by users, textual information, buttons for accessing the assistive devices, etc.) rules also how web sites must be created (and tested) for guaranteeing accessibility.

Concerning web sites accessibility, the law is based on international recommendations as chapter 1194.21 of Section 508 of the USA Rehabilitation Act [13], and on guidelines provided by international bodies such as World Wide Web Consortium (W3C [14]) and, in particular, the recommendations of Web Accessibility Initiative (WAI [15]).

Moreover the project for the Italian Culture Portal adopts the guidelines proposed by MINERVA EU Project, concerning requirements and testing methodologies for the creation of "good quality web sites", to be not only technically accessible but also completely usable. The handbook for "Quality in cultural web sites"<sup>1</sup> recommends a technical test for accessibility to contents and a subjective test for the usability of information and services.

The minimum level of accessibility for all users (including people with complete or partial visual disabilities) takes into consideration what appears in the browser window, for technical aspects and for the contents, and imposes (amongst others) the following requirements:

- It is mandatory to adopt a DTD Strict and to use XHTML. Such recommendation implies to separate content from layout, and forbids to open new windows within the present one. Such an issue imposes some specific constraints specially when pieces of contents are imported from other web sites (e.g. through RSS feed);
- The use of frames must be avoided;
- Every non textual object must have an equivalent textual alternative. Therefore, images, audio and video streamings must be integrated with a text (from simple captions to a complete synchronized under-titling) in order to make assistive devices able to read all the objects of the page;
- Sensible maps must be client side or, if not possible, they must be linked to textual alternatives;
- It must be possible to easily distinguish main information from the background, both for graphic or audio components. This remarkably impacts on the use of colours and backgrounds;
- Layout and contents must be resizable, without overlapping or loss of information;
- Table-based layouts should be avoided; it is recommended to adopt a CSS based layout, using the element <div>
- Tables of data must be provided with information to be correctly interpreted by assistive devices, such as screen readers. Forms too must be created taking into consideration that they could cause problems when read by assistive devices;
- Pages must be usable even when scripts and applets are disabled or not supported;
- Links must be understandable even if read out of their context. User must be able to click them even through keyboard commands, technologies of keyboard emulation and pointing devices alternative to the mouse. This implies constraints of their position in the page, as they must not be too close each other.

Evaluation procedures are based both on automatic and semiautomatic validation systems and on the analysis carried on by an expert in web technologies and accessibility. The project suggests to evaluate the web site with the cooperation of a user panel, including impaired users, according to the following (subjective) quality criteria:

- perception
- comprehensiveness
- efficiency
- consistency
- safety
- security
- transparency
- easiness of learning system functionalities
- availability of helps and documentation
- tolerance to errors
- look and feel
- flexibility

Such criteria must be taken into consideration both during the design of the web site and in the development of the interface after this first evaluation.

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<sup>1</sup> <http://www.minervaeurope.org/publications/qualitycriteria.htm/>

## Notes and References

- [1] Project responsables for MiBAC: A. P. Recchia, R. Caffo. Project responsible for SNS: S. Settis. Coordinators: B. Benedetti, U. Parrini. Working group: P. Baccalario, I. Buonazia, M. Delcaldo, M. E. Masci, D. Merlitti. Consultants: G. Cresci, O. Signore, P. Valentino.
- [2] PICO AP – Portal of Italian Culture Online - Application Profile.
- [3] PURL - Persistent Uniform Resource Locator: <http://purl.oclc.org/>
- [4] MiBAC website: <http://www.beniculturali.it/>
- [5] OAI-PMH – Open Archive Iniziative – Protocol for Metadata Harvesting: <http://www.openarchives.org/OAI/openarchivesprotocol.html/>
- [6] DCMI - Dublin Core Metadata Initiative: <http://dublincore.org/>
- [7] For DCES – Dublin Core Element Set, see: <http://dublincore.org/documents/dces/>
- [8] DC elements and terms are defined in: <http://dublincore.org/documents/dcmi-terms/>. See also *DC Metadata Registry*: <http://dublincore.org/dcregistry/>. For Qualified DC, see: *Using DC Qualifiers*: <http://dublincore.org/documents/usageguide/qualifiers.shtml/>; *Expressing Qualified DC in RDF/XML*: <http://dublincore.org/documents/dcq-rdf-XML/>
- [9] Definition of ‘Application Profile’ from the DCMI Glossary: “In DCMI usage, an application profile is a declaration of the metadata terms an organization, information resource, application, or user community uses in its metadata. In a broader sense, it includes the set of metadata elements, policies, and guidelines defined for a particular application or implementation. The elements may be from one or more element sets, thus allowing a given application to meet its functional requirements by using metadata elements from several element sets including locally defined sets. For example, a given application might choose a specific subset of the Dublin Core elements that meets its needs, or may include elements from the Dublin Core, another element set, and several locally defined elements, all combined in a single schema. An application profile is not considered complete without documentation that defines the policies and best practices appropriate to the application”. See: <http://dublincore.org/documents/usageguide/glossary.shtml>
- [10] This document is downloadable at: <ftp://ftp.cenorm.be/PUBLIC/CWAs/e-Europe/MMI-DC/cwa14855-00-2003-Nov.pdf>.
- [11] See: *DCMI Type Vocabulary*: <http://dublincore.org/documents/dcmi-type-vocabulary/>
- [12] Disposizioni per favorire l’accesso dei soggetti disabili agli strumenti informatici - [http://www.pubbliaccesso.gov.it/normative/legge\\_20040109\\_n4.htm](http://www.pubbliaccesso.gov.it/normative/legge_20040109_n4.htm)
- [13] See: [http://www.pubbliaccesso.gov.it/normative/rehabilitation\\_act/index.htm](http://www.pubbliaccesso.gov.it/normative/rehabilitation_act/index.htm)
- [14] W3C website: <http://www.w3.org/>
- [15] WAI website: <http://www.w3c.it/wai/>