# Computer aided graphic documentation for conservation or processing of information in the context of conservation.

**Report of Giancarlo Buzzanca**

*Ministry of Cultural Heritage and Activities and Tourism, Rome*
"*CA GraDoCo—Computer Aided Graphic Documentation for Conservation: Bibliographic Review and Analysis of Best Practices, Standards and Customization (1997/2007/2017)*"

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Synopsis

> *The research synopsis is the plan for your research project. It provides the rationale for the research, the research objectives, the proposed methods for data collection and recording formats and / or questionnaires and interview guides*[1].

What would be the meaning and sense of *Computer aided graphic documentation for conservation* if we analyzed the issue from an operational and critical point of view[2] rather than paying attention to the philosophical, as improperly defined, aspects and / or to the statements of principle?

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Where we try to evaluate the usefulness of some tools and some operational methodologies, it becomes important to understand what are the conceptual and technical challenges implemented in the recording and digital documentation of restoration and conservation interventions. The definition of needs is the first step in establishing a temporal sequence of the conservation and restoration project. In other words, a correct definition of the methodological approach is needed, which considers the utilities and costs of these phases with extreme attention.

These were the points of reference for the execution, as **conservation guest scholar**, of a research project that took place in the first three months of 2019[3], on the specific topic of *Computer aided graphic documentation for conservation*, at the GCI (Getty Conservation Institute ) in Los Angeles.

The project, in its structure and for the type of adopted approach, cannot be considered concluded and this essay aims to provide the correct framing, both as regards the results to date, and with regard to the study areas still unexplored. In other words, I think we can speak of a line of research that is still active and growing.

The key elements of the project refer to three different and subsequent time periods, dating back to 1997, 2007 and, provocatively, today:

- 1997, when the GCI monitored and recorded the conditions of the gigantic mural located on Olvera Street in Los Angeles, David Alfaro Siqueiros' América Tropical[4]. The Getty website makes clear that "*Graphic documentation was carried out on site both manually and with tablet computers to record technique of execution, conditions, previous interventions, treatments by the GCI and post-treatment monitoring. Maps were created with computer-aided drafting software to be used as baseline information and for comparison to monitor change over time*"[5]. The IT structure of the *Condition report*, resulting from a radical customization of AutoCAD, was also designed by myself [6], while the on–site registration was carried out by a brilliant group of GCI conservatories, among whom I remember Leslie Rainer, excellent coordinator of the group.

- 2007, is the date of publication, edited by GCI, of the two volumes relating to the RecorDIM project – *Recording, Documentation, and Information Management for the Conservation of Heritage Places*[7]:

    - *Vol. 1, Guiding Principles*[8], Robin Letellier, with contributions from Werner Schmid and François LeBlanc;

    - *Vol. 2, Illustrated Examples*[9], edited by Rand Eppich and Amel Chabbi.

- 2019/2020, it is time to gather again ideas and proposals for *Computer aided graphic documentation for conservation (CAGraDoCo)*, as a tool for the conservator, arriving at a well-defined idea of "documentation methodology". This phase has started at and thanks to the GCI, as previously specified, but it cannot be considered concluded yet.

In this complex framework, the identification of the existing codes of ethics, guidelines and standards assumes particular value, in addition to the knowledge of the graphic documentation activities. The ultimate goal is in fact to make computer-based documentation an activity specifically devolved to the conservator / restorer, where codes of ethics, guidelines and standards are the reference points for defining the conservative history of the individual artifact, documentary narration that at the moment seems to be essentially absent.

Reasoning in a truly broad perspective, the goal has been and still is today to collect a reasoned and careful bibliography through which to draw a real atlas of the applications currently in place in light of the principles elaborated by codes of ethics, guidelines and standards in force.

## Description and explanation of the contents

I start by saying that aspects of the history of conservation must be discussed with the necessary awareness. The evolution of intervention techniques and the growing attention paid to the maintenance and care of cultural heritage have gradually changed the approach with which we intervene on these objects. The value of cultural heritage is increasingly recognized from a more general point of view than an approach linked to purely aesthetic aspects.

The sense of this premise is to understand that the acquisition of an awareness of the meaning and role of conservation also involves particular attention to the recording of the characteristics of the same objects (cultural heritage) and the evolution of a branch of scientific applications related to these functions and these values.

From this attitude towards objects from the more or less distant past (we also deal with the contemporary), a more careful conception of the conservative intervention derives: an intervention that wants and must be respectful of both origins and history that the monument or the object they have gone through. This is to allow those who come after us to fully appreciate the asset with all the complexity of stories, meanings, information that it is able to transmit to us and that we are able to read.

The theory of restoration, as conceived by Cesare Brandi, is the indispensable premise of a close relationship between scientific and humanistic spheres. No less significant are some of Umberto Baldini's interventions that fit into this logic with a strong drive of innovation[10].

Let me be clear that I use these definitions, which I would consider more than obvious for anyone who "hangs out" on conservation, strictly rhetorical, as in this context the documentation can assume an increasingly important role, as highlighted, moreover, in the first theoretical declarations which mark the history of restoration.

A clear documentation of the conservative intervention is necessary to safeguard the originality of the work. This type of sensitivity emerges even before the theoretical codification of the rules for a good restoration, enshrined in the various "restoration documents". But the role of documentation (whether we are talking about a building, a painting, a work or a cultural

website) does not end with that of "historical testimony of the intervention". Finally the exceptional conservative intervention, but also the maintenance itself, become an opportunity to deepen our knowledge of the work, to refine the execution techniques, to develop preventive methods that prevent or delay the onset of a degradation that could compromise the artifact.

On the other hand, owning a large amount of data without being able to access it is equivalent to not owning it: it is as if the catalog of a large library had been destroyed and the books were put on shelves in bulk. The documentation therefore, in a more general framework, consists first of all in a project of information that will be collected, then in the recording of the data and finally in their organic and structured acquisition to allow in the future the maximum degree of accessibility. It is important that all the information collected, both in the preliminary phases of the study, both during and after the conservative intervention, is archived in an orderly manner.

All this material will be transmitted to those who will still work after us, it will be the starting point, a "medical record" from which to avoid repeating mistakes, improve intervention methods, allow more precise studies and expand knowledge of the artifact. Being able to make comparisons on the state of conservation at regular time intervals is, for example, of fundamental importance in planning future maintenance operations.

The studies accompanying a complex conservative intervention are numerous and refer to different specialist skills. Let us take the clearest of the examples: the mapping of the forms of alteration is undoubtedly of fundamental importance in the design of the conservative intervention. This survey, extended to the whole surface, is fundamental to form a first idea of the condition of the object and constitutes an irreplaceable document at the end of the restoration operations. The mapping guides the conservation expert in choosing further specialized scientific investigations, such as structural, chemical, biological, etc. The choices relating to the investigations to be carried out cannot be defined in a protocol since the situations in which the conservative intervention is performed can be very different; sometimes specific preliminary studies may be needed.

Once the intervention methods have been developed and the necessary experiments have been carried out, the construction site is opened. A new phase therefore begins in which the documentation is enriched with new material such as the mapping of conservation interventions and the photographic documentation of the surfaces before and during the operations.

Even with the conclusion of the intervention, the research activity does not stop because tests to verify the behavior of the materials and the monitoring of any repetition of alterations will be carried out at regular intervals.

These periodic checks are of fundamental importance to adapt the planned conservation plan *ab initio* and to reduce the operations to be carried out over time.

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The information collected is plentiful and the material is heterogeneous: graphs, reports, technical data sheets, analysis of samples, photographic documentation and attachments of all kinds.

Organizing all this material is often a job in itself.

The greater complexity of the studies carried out today compared to the past has been accompanied by the progress of the information technologies that allow managing this large amount of data. The parallel development of databases and software capable of managing raster data (images) and vector data (CAD) has led to the development of a very important technology such as GIS. This acronym, which means "*Geographic information system*[11] ", distinguishes those systems that can associate graphic data and alphanumeric data, allowing research and analysis on them.

GIS are software designed to combine different types of content through a cartographic interface called "map". These tools, born for the production of geographic maps, are traditionally used in the planning and management of the territory and in archeology. The application of the same technology to the surfaces of a building has made GIS popular also in the field of conservation. GIS technology allows you to create a true "atlas" of the surfaces of a building on which to report any type of information available.

The data managed by these systems can be traced, simplifying, into four categories:

- the cartographic data in raster format which constitute the case of a satellite photographic base or in general of an ortho-photo in which each pixel of the image corresponds to a well-defined point of the object and has known coordinates;

- geometric / geographic data in vector format, such as administrative boundaries, roads, points of relativity, elements of interest;

- "structured" alphanumeric data, ie numbers and texts encoded in such a way that they can be contained in tables with a predetermined structure;

- unstructured alphanumeric data such as video, audio, text documents and in general any attachment whose content hasn't a prior determined structure. This content can be entered into an information system by filling out a short descriptive sheet for each of them containing "metadata" or "data on data". The metadata will allow you to search and quickly identify the attachments of interest in exactly the same way in which the consultation of a catalog allows us to quickly access the publications of the library.

The main theme of this discussion is clearly the practice of experience and the contents are reserved for those who carry out documentation activities (high and low level) in the context of restoration interventions.

The central idea, deepened for a long time, in the practical and theoretical aspect, is that restorers must be put in the condition to be able to actively and constructively use information

systems without becoming IT scientist or designers or engineers, but, to do this, they need friendly user interface.

Exactly for this reason, it is necessary to speculate which are the needs and consequent requests of restorers and conservation experts in terms of specialized software for documentation. More precisely, the question is if it is necessary to use digitized graphic documentation that includes a database approach and, if so, what are the advantages over proven traditional methods.

A synoptic analysis and, moreover, a definition of glossary must involve a discussion involving suppliers (documentation and / or IT specialists) and users (conservator-restorer, conservation manager and related conservation specialists).

Unfortunately, I have found that doesn't exist a shared bibliography and indeed the authors of publications on the subject are sometimes more interested in placing themselves in Olympus than in contributing to a critical debate based on the discipline. It would be possible to indicate, in this sense, some particular interventions which, since the restoration project is in fact construction and not "critical" of the past, should positively and proactively compose the archive of the memory of the scientific field we practice.

From this point of view, the Code of Ethics developed by AIC (The American Institute for Conservation of Historic and Artistic Works) [12] assists us. In this essay I do not indicate the chronology of the updating of these codes and how the digital aspects have been included in the conservator's working practices since 2001 through the *Commentaries to the guidelines for practice*[13]

The following are the opening words of the *Code of Ethics* as regards the documentation area:

24. **Documentation:** *The conservation professional has an obligation to produce and maintain accurate, complete, and permanent records of examination, sampling, scientific investigation, and treatment. When appropriate, the records should be both written and pictorial. The kind and extent of documentation may vary according to the circumstances, the nature of the object, or whether an individual object or a collection is to be documented. The purposes of such documentation are:*
    1. *to establish the condition of cultural property;*
    2. *to aid in the care of cultural property by providing information helpful to future treatment and by adding to the profession's body of knowledge;*
    3. *to aid the owner, custodian, or authorized agent and society as a whole in the appreciation and use of cultural property by increasing understanding of an object's aesthetic, conceptual, and physical characteristics; and to aid the conservation professional by providing a reference that can assist in the continued development of knowledge and by supplying records that can help avoid misunderstanding and unnecessary litigation.*
25. **Documentation of Examination:** *Before any intervention, the conservation professional should make a thorough examination of the cultural property and create appropriate records. These*

*records and the reports derived from them must identify the cultural property and include the date of examination and the name of the examiner. They also should include, as appropriate, a description of structure, materials, condition, and pertinent history.*

26. **Treatment Plan:** *Following examination and before treatment, the conservation professional should prepare a plan describing the course of treatment. This plan should also include the justification for and the objectives of treatment, alternative approaches, if feasible, and the potential risks. When appropriate, this plan should be submitted as a proposal to the owner, custodian, or authorized agent.*

27. **Documentation of Treatment:** *During treatment, the conservation professional should maintain dated documentation that includes a record or description of techniques or procedures involved, materials used and their composition, the nature and extent of all alterations, and any additional information revealed or otherwise ascertained. A report prepared from these records should summarize this information and provide, as necessary, recommendations for subsequent care.*

28. **Preservation of Documentation:** *Documentation is an invaluable part of the history of cultural property and should be produced and maintained in as permanent a manner as practicable. Copies of reports of examination and treatment must be given to the owner, custodian, or authorized agent, who should be advised of the importance of maintaining these materials with the cultural property. Documentation is also an important part of the profession's body of knowledge. The conservation professional should strive to preserve these records and give other professionals appropriate access to them, when access does not contravene agreements regarding confidentiality.*

These indications serve to renew the consideration, expressed in the introduction of this essay, which is essential to take into consideration and analyze *Guidelines*, *Code of ethics* and *Standards*.

*Guidelines* –. A guideline is a set of information developed systematically, based on continuously updated and valid knowledge, drawn up in order to make desired behavior appropriate and with a high quality standard. These rules are contained in documents brought to the attention of an audience of interested parties (for example with a circular) and constitute a starting point for the setting of behaviors and modus operandi shared in organizations of all kinds[14]

▪ *Code of ethics* – A code of ethics is a guide of principles designed to help professionals conduct business honestly and with integrity. A code of ethics document may outline the mission and values of the business or organization, how professionals are supposed to approach problems, the ethical principles based on the organization's core values, and the standards to which the professional is held[15].

▪ *Standards* – It is necessary to define a lexicon containing general terms, graphic indications, categories of databases and structure of information to describe the state of conservation, executive techniques and so on. An apparently banal conclusion is that knowledge of specialist literature in this broad sector is a condition *sine qua non* for the

elaboration of an overall and general project dedicated to the very meaning of graphic documentation (digitized or not).

## Previous

The interest personally dedicated to issues related to graphic documentation performed through IT tools comes from far away (over time) and a personal synthetic self-bibliography [16] on the research activity in these areas serves to clarify quite a few issues.

A necessary notation (which should not be understood as self-celebrating) refers to the GraDoc[17] seminar whose acronym, not coincidentally, helped to generate the name of this project.

From the presentation of the seminar, curated by Nicholas Stanley-Price we can read that:

> *The topic of the seminar whose proceedings are published in this volume was Graphic Documentation Systems in Mural Painting Conservation (abbreviated as GraDoc). It combines ICCROM's longstanding dedication to the specific field of mural painting conservation with the more general question of documentation of cultural property. As ICCROM's mandate requires, the contributions to the seminar are international in scope and relevant to a much wider field than mural paintings alone. Any review of documentation methods raises a number of questions: why document? What constitutes adequate documentation? Who determines this, and who is responsible for producing it? What methods are most appropriate for recording, and for disseminating the results? Moreover, how can the records themselves best be preserved? The seminar did not resolve all these questions, of course, but, as the volume makes clear, it gave rise to substantial contributions and a lively discussion. It reports both theoretical debate and practical guidelines, while also exploring the role of rapidly evolving technology in documentation systems. Technological advances make possible much more detailed documentation, as the papers collected here and the CD-ROM enclosed with them illustrate very well. They are contributing exciting new approaches to what remains the ultimate aim, namely ensuring the long-term preservation of decorated architectural surfaces, which constitute an important element in our cultural heritage.*
> *Nicholas Stanley-Price Director-General 22 October 2000*[18]

I contributed to the seminar not only as part of the staff who took care of the design and implementation[19], but also with a report presented in the session dedicated to the computerization of the documentation and  taking care of the two chapters related to sitography and bibliography[20] contained in the CD attached to the publication.

> *An enormous number of persons and institutions have contributed directly or indirectly to this project and to the publication of its results. ICCROM and the co-organizing partners would like first of all to thank the European Union for electing this GraDoc under the Raphael 1999 Programme, which has allowed us to give the project the broadest possible scope. We are also grateful to The Getty Conservation Institute (GCI) and English Heritage (EH) for having provided additional funding*

*towards this publication, thus permitting us to include more material than initially planned. Furthermore, the Istituto Centrale per il Restauro (ICR) in Rome contributed substantially in staff time and expertise.*

*Special thanks are due to the directors of all partner institutions, namely the Wall Painting Department of the Courtauld Institute (CIA), London, the Getty Conservation Institute, Los Angeles, ICOMOS-CIPA, the Institut Royal du Patrimoine Artistique (IRPA), Brussels, the ICR, the Consiglio Nazionale delle Ricerche (CNR) — Area di Ricerca di Roma — and the Niedersachsische Landesamt fur Denkmalpflege (NLD), Hannover, Germany.*

*GraDoc is the result of an intense and fruitful joint effort and we would like to acknowledge the tireless enthusiasm and commitment of the group of specialists who co-operated in all phases of the project:*

- *Giancarlo Buzzanca (ICR),*
- *Sharon Cather (CIA),*
- *Maurizio Forte (CNR),*
- *Rolf-Jurgen Grote (NLD),*
- *Robin Letellier (ICOMOS-CIPA),*
- *Gaetano Palumbo (GCI),*
- *Francesca Pique (GCI), and*
- *Walter Schudel (IRPA)*[21]

If we use, as an analysis tool, a verification of the publications contained in both the OPD[22] and ICR[23] journals, the most recent contribution is exactly my article entitled *Documentazione grafica digitalizzata tra Open Standard e Closed Proprietary Formats*[24], which confirms the fact that we cannot count on recent contributions and radical innovations.

Focusing the analysis on the two institutional journals, I underline a series of articles written by Stefano D'Amico[25] and Angelo Rubino on the ICR Bulletin and which "detach" from other contributions where, apart from the lack of a specific professional indication about the material author of the documentation, in the description of the restoration works carried out, a specific chapter dedicated to documentation from a critical point of view is missing, that is, description and analysis of specifically adopted tools and software.

The Dossier " *La documentazione digitale da Michelangelo a Cimabue* ", edited by me and Francesca Piqué on issue 5/2002 of the ICR Bulletin[26], in which an attempt was made to draw a picture of the situation, not only on an Italian basis, is exempt from these considerations. A publication that would be extremely stimulating to repeat now by probing the sea of IT applications (the serious ones, of course) in the international context.

I had already highlighted how in the "conservative" literature there are examples of restoration interventions from which, although the realization of digital documentation is inferred, a sort of shyness is evident in the reference to the documentation production software. In this group, however, it is necessary to underline a couple of articles that start from different assumptions[27].

## Automation vs computerization

Proceeding by small steps, I quote again extensively what is mentioned in the article *Documentazione grafica digitalizzata tra Open Standard e Closed Proprietary Formats*[28], more specifically in the chapter entitled "Introduction (in the form of provocation)".

A sort of contraposition that should make it clear as, in general, when it comes to computerization this is mostly apparent: it is automation, or a mechanization of procedures and tools, not preceded or followed by the elaboration of an autonomous logical thought.

Please forgive a "computer science professor" joke if I say that computer logical thinking, represented by characters such as Charles Babbage, Alan Touring or Ted Nelson, is completely denied in the automation process, to be identified as a simple replacement of human work through automatic control of processes and functions[29] that should belong to man. It is no coincidence that the current winning style is Steve Jobs' model, or the exploitation of the intelligence of others in these areas for exclusively commercial reasons. It is clear that our model, in this discussion and in this organizational scheme, is much closer to Richard Stallman or to Linus Benedict Torvalds, that is, to an open or free interpretation, rather than to Steve Jobs as a marketing model.

It is not, in fact, the first time that I find myself dealing[30] with the theme of the development of computer-aided design and design techniques, or of CAD[31] (Computer Aided Design) techniques applied to the world of conservation. In recent decades, these techniques have established themselves so much that they have become the tool usually adopted for the production of information related to conservative activities, whether it is carried out through thematic mappings[32], or that it is implemented through topographical representation of information relating to the disparate diagnostic activities.

The use of CAD techniques has taken hold without (I can only reiterate a statement of some years ago) precise rules have been defined at same time for the production, treatment, sharing, exchange, maintenance and retention of digital information. Furthermore, in principle, a conscious use of CAD techniques has not developed in those who produce or commission the documentation that has been improperly defined computerized and that we should better catalog, given the premise just made, simply typed on a computer (ergo automated), rather than drawn on a drawing board. The treatment of information carried out in this way, ie without a solid basis of standardization and culture of the procedure, does not produce any benefit but it is only a mimesis of what is done manually. Usually much more expensive because it is based on spectacle rather than content. We leave the packaging of the product to the virtual techniques...

The graphic documentation of the restoration operations remains, therefore, one of the most overlooked and underestimated issues in the world of conservation. The advent of the digitalization of procedures has not produced, in this context, as it is easy to see from the analysis of the technical / scientific literature of the last few years (...) a level of overall

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improvement of procedures, practice and awareness both theoretical and technical, which instead it is possible to trace in other sectors.

In short, to put it in simple words, while the digital world was running fast and producing, in different sectors, innovation and improvement of procedures, barkers and good sellers first proposed and then, in fact, imposed a model which is given by not having models but only local solutions for the use and glory of this or that project.

I avoid talking about three-dimensionality in favor of the camera, virtual reconstructions and all the paraphernalia that, as mentioned, is based on the benefit given by the spectacularization.

The solutions adopted, it is clear, also qualitatively excellent, rightly protected at least according to the current but obsolete, as regards the aspects of digital, legal orientation[33] , but nothing, absolutely nothing, that comes close to shared standards (de facto or de jure that it is, it matters little) or, even more importantly, that takes into account the possibility of the germination of a community of developers and the consequent creation of a shared and shareable heritage.

Moreover, an absolutely not secondary aspect, the standard (we now use this word and we will later specify its complete meaning and limits) to which we refer must be understood as free from commercial properties.

In fact, a community of developers could not exist if we were to remain in the field of commercial application design. We could only speak of adaptations of marginal aspects with respect to proprietary code (I mean the source code of the software), an identical scenario to the design of the Apps that are currently the most popular.

The world of open source, on the other hand, indicates the possible alternative line of development, which is to create Condition reports and documentation (graphic and non-graphic) of the entire restoration process without the necessary dependence on commercial products, are these provided by the rules imposed by the great masters of the world of Computer Aided Documentation (Autodesk and Adobe above all, depending on whether we are talking about vector-based or raster-based documentation), whether we refer to the customized product of this or that software house which, in any case, it will always be strictly connected to the guide product.

However, it is equally evident that a theoretical discourse cannot serve anything other than to create discontent and the sensation of criticism fired at zero cost and towards indistinct objectives. The topic of Codes of ethics, guidelines and standards therefore enters this discourse due to its absence, at least on an Italian basis, while a look on a world-wide basis, on the contrary, really leaves us banned (in a positive sense) on the development lines currently in definition course.

Nevertheless, as already stated and reiterated, the problem is a clear knowledge of what is happening and starting, I repeat, from a correct, prudent, accurate and updated bibliography.

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## Web as a distribution and sharing tool

The tool through which a part of these sharing and analysis operations can be activated is, I believe with conviction, a website intended as a place for gathering and analyzing information. Last but not least, this website should be a place for discussion since the issues relating to the scope of the survey is certainly not at the height of interests even in our limited world.

It is a website that has been designed and created as part of the research project, as the first public display of the first results of the analysis conducted, which aims to be (at least in the design intentions) a beacon for the community of "documentators and digital detectors ": the URL is http://www.cagradoco.online/ [34]

The first goal was to build a website whose name adopts the acronym, with symbolic value, which gives name to the project and which chooses .online as the first level domain [35].

The basic observation is that the research result has shown enormous development in the high-level documentation system. It is curious to observe, for example, the evolution of the contributions presented in the CIPA congresses of the last few years which, on the other hand, has demonstrated an almost total absence of interventions aimed at an intuitive (but not low-level) use of computer techniques devoted to documentation graphics of clear utility and usability. The period as a scholar at the GCI allowed me to fine-tune the project, also taking into account, as regards the Getty Research Institute Library, as well as the exceptional third-party facilities, the accesses allowed to online bibliographic repertoires [36].

The goal of the project, of which the website is the translation (albeit not exhaustive) of an action line, is to show news in the field of documentation as well as provide updates on the work that continues to take place. The project itself is not to be understood in a static or administrative key but as a real project management aimed at making available a tool for researchers that allows greater knowledge of the state of the art and that highlights the need for progress technical and methodological.

At present, over 850 bibliographical references divided into 22 categories can be reached through the site, using the Zotero application.

The categories in question refer to the analyzed heritage that had GraDoc and RecorDIM as reference points precisely because in both cases the bibliographic indications were (and are) strictly connected to the type of analysis that we intend to carry out at the present.

In fact, the Zotero application does not make bibliographic data available in the restrictive sense of the term but each of the resources analyzed includes a description sheet for the publication in order to provide additional and clear information on the content of the same publication.

The bibliographic citations that of course the Zotero software offers in various standard modes, have been organized according to the "Chicago Style"[37]

In the analysis phase and related classification, at the beginning of 2020, there are approximately 1,400 additional texts (articles, publications etc ... partly collated in the period spent at the GCI) already identified and available in PDF format. The insertion of this huge quantity of new texts in the bibliography, after analyzing the contents for each contribution for the purpose of constructing an exhaustive bibliographic record, is foreseen in times compatible with current job responsibilities.

## Technical description of the CaGraDoCo website

The website was created using the WordPress Content Management System. The adopted theme is Unos which, of course, has created a Child theme or an additional directory, which contains the files necessary to maintain personalization (as designed by the user [38]) to the main theme used, even when performing the periodic update of the theme itself. Otherwise, if even a minimal customization of the theme used had been carried out (link color, background, etc.) this would be lost every time the periodic update of the theme was used as the old files would be overwritten by the more recent ones.

The bibliographic aspects are treated through the ZotPress plugin that allows you to incorporate the bibliographies treated and recorded through Zotero [39] into the site.

The characteristics of the applications, as described in the software presentation page, are as follows [40]:

- Displays your personal and group Zotero items through in-text citations, bibliographies, and searchable libraries
- Supports thumbnail images through WordPress's Media Library and Open Library
- Supports selective CSS styling via IDs and classes
- Provides a range of additional features, such as allowing visitors to download citations

As an obvious essential feature of the product, it should be emphasized that both access to the site and to the bibliographic repertoire are obviously completely free because the reference to the open world is certainly not adopted for "pretend".

Finally, the online publication dates back to the middle of March 2019.

*Alterum non datur atque repetita juvant semper.*

## Zotero table

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- RecorDIM –
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## Bibliographic notes

Cinzia De Michele, once again, patiently revised all subsequent versions, heroically resisting boredom and involved language, providing interesting ideas for discussion.

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[1] http://intra.tesaf.unipd.it/pettenella/Corsi/ReaserchMethodology/ResearchSynopsisWriting.pdf

[2] critique s. f. [from gr. κριτική (τέχνη) "art of judging" (...) Which does not mean that the point of view should be negative In the Treccani vocabulary we also find this definition: *Complex of investigations aimed at knowing and evaluating, based on different theories and methodologies, the various elements that allow the formulation of judgments on the works of human genius.* http://www.treccani.it/vocabolario/critica/

[3] GCI News 2018–19 Conservation guest scholars. Giancarlo Buzzanca, Ministry of Cultural Heritage and Activities and Tourism, Rome "CAGraDoCo — Computer Aided Graphic Documentation for Conservation: Bibliographic Review and Analysis of Best Practices, Standards and Customization (1997/2007/2017)" January – March 2019 https://www.getty.edu/conservation/publications_resources/newsletters/33_2/gcinews11.html

[4] For a quick description of the activities: https://www.getty.edu/conservation/our_projects/field_projects/siqueiros/siqueiros_documentation.html

[5] https://www.getty.edu/conservation/our_projects/field_projects/siqueiros/siqueiros_documentation.html

[6] M. H. Bishop, G. Buzzanca, L. Rainer, G. Palumbo, "Digital Recording of the Condition of America Tropical, a Mural by David Alfaro Siqueiros", in New Techniques for Old Times. CAA 98. Computer Applications and Quantitative Methods in Archeology. Proceedings of the 26th Conference, Barcelona, March 1998, Barcelò, J.A. (Ed.); Briz, I. (ed.); Vila, A. (ed.); p.59-63, Oxford: BAR International Series 757 G. Buzzanca, G. Palumbo, L. Rainer, M. H. BISHOP, A*merica Tropical: un murale di David Alvaro Siqueiros. La registrazione del Condition Report.* Bollettino dell'ICR, n° 1, 2000, pp. 13-27

[7] Recording, Documentation, & Information Management (RecorDIM) Initiative (2003–2007) https://www.getty.edu/conservation/our_projects/field_projects/recordim/index.html

[8] Recording, Documentation, and Information Management for the Conservation of Heritage Places: Guiding Principles http://www.getty.edu/conservation/publications_resources/pdf_publications/recordim.html

[9] Recording, Documentation, and Information Management for the Conservation of Heritage Places: Illustrated Examples http://www.getty.edu/conservation/publications_resources/pdf_publications/recordim_vol2.html

[10] Firenze Restaura, 1972. Introduction by Giancarlo Buzzanca "Reale vs Virtual" http://www.firenzerestaura1972.beniculturali.it/index.php?it/242/giancarlo-buzzanca-presentation

[11] *Indicazioni per un progetto di restauro con appendice bibliografica,*, edited by L. Marino, Alinea ed, 2006, 80 pp. It is certainly an interesting publication. It contains bibliographical indications, although summary, relating to at least 800 texts considered from 1895 until 2006 year of publication of the volume. Of no less interest is the brief indication contained in note 1 of the article by the same author, *Archeologia e restauro. Restauro dell'archeologia*, contained in Archeologia e restauro dei monumenti. I Ciclo di Lezioni sulla Ricerca applicata in Archeologia (Certosa di Pontignano 1987) (edited by) R. Francovich, and R. Parenti, All'Insegna del Giglio - Florence - 1988, pp. 476 where Marino notes that, if we consider the total of the publications in the context of which it deals, or the archaeological restoration, the aspects relating to the relief (relief techniques) ranks 19th with a percentage of publications equal to 0.97 of the total.

[12] https://www.nps.gov/training/tel/Guides/HPS1022_AIC_Code_of_Ethics.pdf

[13] Approved by the AIC Board of Directors, May 2001 Revised and approved by the AIC Board of Directors, September 2008

[14] https://it.wikipedia.org/wiki/Linea_guida

[15] https://www.investopedia.com/terms/c/code-of-ethics.asp

[16] Digital Documentation in conservation activities. Bibliographical indications on the production of contributions

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[17] https://www.iccrom.org/sites/default/files/2018-02/2000_schmid_gradoc_rome_77215_light.pdf

[18] GraDoc - graphic documentation systems in mural painting conservation: research seminar Rome 16-20 november 1999 / edited by W. Schmid, Rome: ICCROM, c2000 - VIII, 345 p. : ill. ; 30 cm (In allegato CD-ROM)

[19] A not really secondary notation is necessary for Michele Cordaro, then Director of the ICR (1995-2000), thanks to which it was possible my very intense participation in representing the ICR which provided official partnership to the Seminar despite the opposition of the then head of the documentation area of the same institution. In addition to participation as a member of the Organizing Committee, I presented the report G. Buzzanca, *An user friendly approach (more about Standards and Customized Menus in Digital Recording of Condition)*, GraDoc Research Seminary, Rome 16-20 November 1999, Rome: Iccrom, pp . 147-16 which included, as annexes, two important interventions: Marcella Orrù and Corinna Ranzi - *Use of a standardized approach for a large-scale computer-aided graphic documentation project at the Basilica of Santa Maria Maggiore in Rome* and Simon WarracK - *The documentation of the conservation of the sandstone reliefs at Angkor Wat in Cambodia*

[20] G. Buzzanca, 2000. "*Selective Survey of Existing Guidelines for Conservation Documentation.*" In GraDoc: Graphic Documentation Systems in Mural Painting Conservation: Research Seminar, Rome 16-20 November 1999. Schmid, Werner (Editor)., 266–77. Rome: ICCROM. In the CD annex to the publication *A User-Friendly Approach: Web Links* and *Selected Bibliography on Computer-aided Documentation*

[21] *Gradoc : graphic documentation systems in mural painting conservation : research seminar* Rome 16-20 november 1999 / edited by Werner Schmid. Rome: ICCROM, c2000 - VIII, 345 p. : ill. ; 30 cm (In allegato CD-ROM)

[22] M. Mercante, F. Kumar, *Il rilievo 3D: applicazioni pratiche nel restauro delle opere scultoree. Il caso de "Le fatiche di Ercole" del Museo Nazionale del Bargello*, 'OPD Restauro', 20, 2008, pp. 73-88. and M Chimenti, M. Lanfranchi, P.I. Mariotti, La documentazione informatica nel restauro: la cartografia tematica nel caso applicativo della cappella maggiore della basilica di Santa Croce a Firenze, 'OPD Restauro', 20, 2008, pp. 193-212.

[23] G. Buzzanca, Documentazione grafica digitalizzata tra Open Standard e Closed Proprietary Formats, OPD Restauro, 25 2013

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[24] S. D'Amico, now interim Regional Secretary of the MiBACT for Region Abruzzo, was a scholarship holder of the CNR - theme "Photogrammetric survey and computerized restitution of monuments and archaeological sites" - Institute for technologies applied to cultural heritage - Research area of Rome - 1997/1998. Interesting publications include S. D'Amico, A. Rubino, *Un'applicazione di fotogrammetria digitale all'Oratorio dei Filippini in Roma: il Miracolo di Santa Agnese dell'Algardi*

[25] G. Buzzanca, F. Piqué (a cura di), Dossier "La documentazione digitale da Michelangelo a Cimabue" Bollettino ICR, 5, luglio-dicembre 2002, pp 7-114:

- G. Buzzanca, F. Piqué, Introduzione
- Introduzione, S. Settis, *L'illusione dei beni digitali*,
- P. Moscati, *Archeologia e informatica: fra tradizione e rinnovamento*,
- F. Petrignani, *L'esperienza dei Musei Vaticani nel restauro degli affreschi michelangioleschi della Cappella Sistina*,
- S. Warrack, *Simplifying AutoCAD for Restorers.Tradition and Innovation*,
- H. Eiteljorg, II, *Documentation with CAD*,
- F. P. Di Giacomo, *L'uso della tecnologia GIS richiede la standardizzazione della documentazione grafica*,
- G. Cerica, *Metadati e standardizzazione delle procedure e dei lessici*,
- F. Petrescu, H. Murariu, *From dots towards databases*,
- M. Forte, *Realtà virtuale e modellazione spaziale del bene culturale: conoscenza e comunicazione*,
- G. Accardo, *Modelli digitali 3D per la Scultura*,
- G. Basile, G. Attolico, A. Distante, M. Malavasi, *La ricomposizione virtuale assistita di frammenti di pittura murale*

[26] G. Buzzanca, *Documentazione grafica digitalizzata tra Open Standard e Closed Proprietary Formats.* The first, in issue 20 of the magazine, is the work of M. Mercante and F. Kumar and the title *Il rilievo 3d: applicazioni pratiche nel restauro delle opere scultoree. Il caso de '*Le fatiche di Ercole*' del Museo Nazionale del Bargello.* The article explicitly talks about the software used and comments as follows: "The conclusions drawn from the evaluation, of this as of other low-cost or free software, make it clear how the technological landscape is fully developed also for those aspects of the IT usually relegated to industry specialists. The use of software for the management of 3D data has also become accessible to the Cultural Heritage restorer. A unique and / or definitive solution isn't proposed here, but only a trace of what can be done, with the hope of instilling the curiosity necessary to encourage the continuation of this project and to expand it. The time has therefore come for the full integration of this technology into the daily work of the restorer. This thesis aims to demonstrate that a low-cost 3D laser scan, released by external technical personnel, allows the restorer to make use of reliable and complete documentation for all phases of his work, following the timing of the restoration / study and producing easily manageable data in network and widespread computers. (...) In this way, the right amount, complexity and depth of information would be obtained only in terms of strict usefulness, greatly optimizing the work process of the Cultural Heritage officer and not only. "Of a much more technical and specific interest cut compared to this discussion turns out to be the article by M. Chimenti, M. Lanfranchi, PI Mariotti. *La documentazione informatica nel restauro: la cartografia tematica nel caso applicativo della cappella maggiore della basilica di Santa Croce a Firenze*. In this case, although we are talking about a product developed starting from AutoCAD (refer to the aforementioned article for a detailed description of the project) we find available to users the articulation of the documentation, the fundamental elements of the Hatch patterns and the lines in .pat and .lin format respectively. They are the formats through which these options are defined in AutoCAD. There are also indications on the colors of the screens or lines (in RGB format and in AutoCAD code).

[27] Graphic documentation article è p.117

[28] The reference is to this article: G.Buzzanca, *Documentazione ...*op.cit

[29] According to JL. Bright (1958), ER Crossman (1960, 1966) and several other authors, automation instead is to be identified according to the substitution of human work: automation therefore would be a particular technology that allows you to replace, through automatic process control, functions that should belong to man. https://it.wikipedia.org/wiki/Automazione .
The progressive maturing of knowledge has led to reason, over time, first of file formats, then of the need for a structuring of contents (definitions of taxonomies, technical specifications and programming languages). Today the general landscape has become very clear and there AgID has dictated clear rules. Clear for those interested in understanding them. The world of conservation, in general, pretended not to notice it, believing, perhaps, that the guidelines and principles should apply to the administrative procedures of the state. From this point of view, the archiving sector, to which I will often refer, demonstrates, on the contrary, a remarkable technical awareness.

[30] Note reported in the article in question which relaunches and updates to 2013 what I have already argued in the article "Need for standards in digitized graphic documentation" published in the magazine "Materials and Structures" in 2003 and, subsequently, in 2005, in the magazine " Arkos "with the article". *Il ruolo degli standard nella documentazione grafica su base vettoriale".*

[31] Often, particularly in the North American area, the abbreviation CADD is also used where the second D stands for Drafting

[32] Articulated according to the classic division that part of the execution techniques and arrives to the current interventions. See, exclusively for the classifying aspects F. Sacco, *Il problema della documentazione grafica dei restauri* , 'Materiali e strutture'', 3 (1993), pp. 25-34 and, out of curiosity, F. Sacco, *A cosa serve la documentazione dei restauri*? 'Geomedia ", 1

(2006), pp. 6-12.

[33] In broad terms, the history of industrial copyright protection is thus outlined by S. Aliprandi *Apriti Standard. Interoperabilità e formati aperti per l'innovazione tecnologica*, Ledizioni 2010, p.12:
"*The current The US legislator therefore issued a law (the Software Copyright Act of 1980) which laid down the principles for the application of copyright to computer programs; and within a few years all the major technologically advanced countries followed suit (Australia in 1984, Great Britain, France and Germany in 1985, European Community with 1991 directive, Italy in 1992 in implementation of the European directive).*"

[34] The entire text can be downloaded with a Creative Commons Attribution - Share Alike 2.5 Italia ali link
http://www.aliprandi.org/apriti-standard/aliprandi_apriti_standard.pdf

[34] At present the ownership of the website is personal

[35] The .online domain extension is a top-level domain that first became available in 2015. It's also considered to be part of the New Generic Top-Level Domain program from the ICANN (Internet Corporation for Assigned Names and Numbers)
https://makeawebsitehub.com/tlds/online-domain/

[36] I cannot fail to mention the positive contribution of Anne Duer, Master of Library and Information Science at The J. Paul Getty Trust · Getty Conservation Institute. Duer provided some interesting bibliographical references

[37] The Chicago manual of style / University of Chicago Press. - 16. ed. - Chicago: The University of Chicago Press, 2010. - 1 v. ; 23 cm

[38] The design and implementation of the Child Theme as well as the development of the CMS were carried out making use of the skills of Cinzia De Michele who took on the burden of introducing the library references resulting from research

[39] Zotero is a free and open source software for managing bibliographic references and related materials (for example PDF files). (see https://www.zotero.org/). Among its main features are integration within the most famous web browsers and text editors, online synchronization of bibliographies, automatic generation of citations , notes and bibliographies. It is developed by the Roy Maszweig Center for History and New Media (RRCHNM) of the George Mason University. Information taken from the entry Zotero in Wikipedia https://it.wikipedia.org/wiki/Zotero

[40] https://it.wordpress.org/plugins/zotpress/

[41] https://www.zotero.org/giancarlo.buzzanca/items

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