*Fig. 1. Participants of ICCROM courses applying OVO methodology. Image by Corrado Pedelì.*

# A METHODOLOGY FOR AN ORGANISED VISUAL EXAMINATION ON CONDITION ASSESSMENT OF CULTURAL HERITAGE

**Corrado Pedelì**
Conservator-restorer, ITALY
c.pedeli@gmail.com

*The condition assessment of cultural heritages is a complex, interdisciplinary and obligatory step of the conservation process. One important and critical part of it is the so called* Visual Examination. *The article proposes a new experimental combined methodology based on the* system approach, *which has been called by the author* Organised Visual Observation *(OVO). OVO aims at reorganising the preliminary direct naked-eye observation which has not really supported by standardized approaches and procedures. OVO is not a documentation/mapping system but it can really support them. It is rather a tool which can help the surveyor to make a careful observation and to mentally process the data. It is also conceived to record and share information by using a common basic synoptic language. The OVO methodology aims at becoming a bridge between different professionals (archaeologist, conservators, architects, scientists, managers) which work on the condition assessment, to give them a method to share basic information and keep all of them aligned and linked with the same goal. OVO is also conceived to maintain a high and constant attention on the context as a whole, as a system, trying to find priorities in term of conservation, addressing the diagnostic investigation and the conservation strategy.*

**Keywords:**
*condition assessment – survey – cultural heritage – conservation process – visual examination – system approach – context – interdisciplinarity*

## 1. INTRODUCTION

This text presents an overview of a new methodology called, by the author, *Organized Visual Observation* (OVO), which is conceived to implement, in a repeatable way, the condition assessment (or survey) for cultural heritage. In particular, the methodology is aimed at supporting the preliminary eye-investigation *on site* commonly known as *visual examination*. It can be also applied in front of an object within a conservation/restoration laboratory. We are talking about the preliminary diagnostic step, which excludes all scientific instrumental analysis, including the use of specific magnifying tools. The common 10x-magnifying lens can also be avoided.

*OVO methodology* aims at reorganizing the naked-eye observation, which is a common practice in the field of condition assessment, but which has often not really been based on standardized approaches, specific procedures and techniques. Usually, the people in charge of carrying out the first phase of the assessment are influenced by their own goals and daily approach, by their own professional background, experience and skills. It is therefore developed from their own point of view. Because of these reasons, the product of the visual examination can be subjective, difficult to prove and mainly unrepeatable, including by the same surveyor. This happens both when people have suitable competences but, (unfortunately) when they also believe to be skilled or when they are aware to be unable and they are equally entrusted to do it! In all these cases we have two problems: a) the result of the visual examination is potentially arbitrary or useless; b) the preliminary visual examination is not performed. This last case is an error that cannot be accepted. My personal opinion is that it is totally wrong to omit this phase of the condition assessment or to substitute it by jumping directly to the following analytical diagnostic step (sampling, instrumental scientific analysis, etc.). The visual examination is the unique crucial moment that should not be missed, along which it is possible to analyse the context (site, buildings, objects, etc.) as a whole and, at the same time, at different levels of abstraction, from a general view to the detail, maintaining the relationships between the different levels of observation. The problem is to do it by using a method that can be shared, to accredit the results and to be able to repeat the observation (= scientific approach).

Even if visual examination is an accepted phase of the condition assessment, unfortunately there is no standard methodology to implement it! There are no guidelines to suggest some field operational process and not only in term of principles: *"what to look"* and *"how to look"*, *"how to do"* for recording the observations and sharing them with other professional by using a common language. The only well-known, implicitly accepted and extensively used supports are the *glossaries*. Certainly these are a great and very useful help to guide the surveyor on the nebulous planet of the identification and description of the alteration and decay patterns, but they have to be considered just as a tool. The visual examination cannot to be reduced to an illustrated and lexical comparison phase. Along my work as surveyor I have become convinced that the preliminary visual examination must be reorganized. For my point of view this means defining the operational process, the sequence of steps to do and exactly how to do them, in particular "how to observe", "how to record" observations and what kind of terminology to use. Thinking about this, it also needs to consider the heterogeneity of potential surveyors (scientists, conservators, archaeologists, managers, who others?); finally it needs to use a method, which can be understood, accepted and used by different kind of professionals.

*OVO methodology* allows the professionals with different background, different points of view and goals to observe, describe and share at different levels, the same thing by using a common neutral language. A conceptually similar writing and reading sharing language is the one used by musicians: the codified music standard notation allows them to play all together.

*OVO* has been implemented during practical sessions on a *system approach* in the field of condition assessment of archaeological sites, especially when working within interdisciplinary groups, both for training and work aims. In particular *OVO* was applied from 2005 within ICCROM courses (ATHAR, Southeastern Europe, CBH and CollAsia) in different countries of the Middle East, Asia and Europe. Recently an Information Geomatics 3D System called Ad Hoc 3D has been implemented following the philosophy of the OVO methodology (PEDELÌ, 2013).

## 2. THE OVO METHODOLOGY (AN OVERVIEW)

OVO is really a methodology, both in terms of approach, principle and operational practice in the field. More precisely it is a combination of several methodologies and languages already existing and borrowed from *cognitive sciences*, *infant learning* and *Information Technology (Computer Science)*. Finally, it is mainly based on the *system approach*.

*OVO* conceives an archaeological site, a building, a monument or an object as a *system* that can be logically decomposed into subsystems and then into simpler entities. *OVO* facilitates the identification of each entity, forcing the surveyor to analyse in systematic way their feature and behaviour, their condition and their relationships, to define physical and conceptual existing interactions. In order to do this, the user must accept some basic conditions: to have a neutral and objective approach, to renounce to his/her own specific goals, to use the minimum of one's own implicit knowledge (in particular the professional ones), to forget about being an archaeologist or an architect or another kind of specialist, and to use a common approach and shareable language.

### 2.1 THE STEPS OF THE OVO METHODOLOGY

The *OVO methodology* comprises a precise operational process made by a combination of coordinated logical and technical actions: visual (naked-eye) observation, data recording, mental elaboration, conceptual graphic representation, deductive process and problem solving. The operational process is organized in three main phases: a) observation and description of visible and objective information, b) data elaboration, c) research of causes. Each phase is divided in specific steps. Phases and related steps must to be implemented following a pre-ordinate sequence.

First step: choose how to conceive what we want to examine, the system: *type/field* of abstraction (or point of view); *scale/level* of abstraction (scale from we want to start to observe it). For example, in the case of an archaeological site we can choose a *technical type* of abstraction, i.e.: the architectural/material/ conservation point of view. Then we decide the *scale* of abstraction from which to start: for instance from a specific sector of the site or from a specific building, ruin (wall, floor, etc.) or from an object.

Second step: implement the logical decomposition of the unknown system, a fundamental and critical step of the *OVO methodology*. The process exactly reflects what three-year old children do systematically in front of an unknown object, without knowing anything about it. They decompose in elementary parts conceptually and also physically what they manage for the first time (we believe that they "break" a toy). Archaeologists do the same when they excavate. Computer scientists do the same when they have to understand elements, which represent a new world. They use a methodology called *Object Oriented Analysis* (OOA), which allows them to approach in neutral way the context as a system. By using *OVO methodology* we start by identifying all the entities, which compose

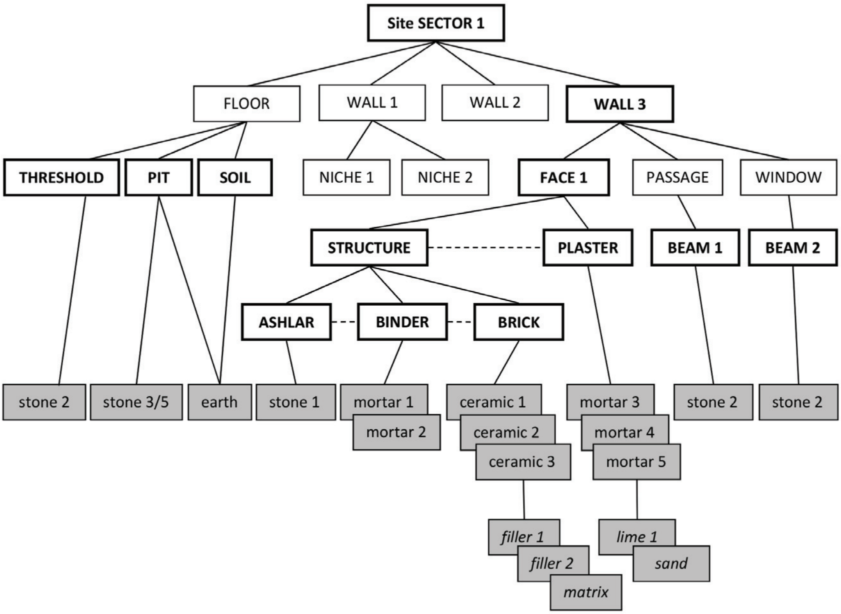


*Fig. 2. Modelling of the real world by using a synoptic representation form (hierarchical diagram). Figure 2 shows an "incomplete" diagram for graphic reasons (layout/page space/clarity of the diagram). For instance, the complete hierarchy for the "wall 1" and "wall 2" was not developed. For the "wall 3" it did not include the "face 2" and the "top", etc. For the same graphic reasons the levels 6 and 7 (material subsystems), are presented in overlapped vertical way instead of being in a horizontal linear way.*

the selected starting system organizing them in two main categories: *functional components* and *material constituents*. At the beginning we simply do a "raw" list of them, i.e.: walls, bricks, ashlars, mortars, ceramic, stone, floor with a pit, passage with a beam and a threshold, one window and two niches. Subsequently we draw a model of our real case study by using one kind of a simple but "severe" diagram which forces the surveyor to respect the hierarchical principle in order to obtain a synoptic representation form (fig. 2). The example shows a diagram organised in seven levels of abstraction: five levels of *functional components* and two level of *material constituents*. This is only one possible logical decomposition approach, which does not exclude other possibilities: i.e. to reduce the number of the abstraction levels or to modify the sequence of them. In any case, it is fundamental to always maintain a logical coherence within the same level and among levels. For instance, it would be a mistake to include a material within a level devoted to a functional component.

The vertical connections underline a "composition state" (*composed by…*) of the system and subsystems positioned at a different abstraction level. A diagram can also include some horizontal connections; usually they can be used to underline the "association state" (*associated with…*) between two or more entities positioned at the same abstraction level. An appropriate space between level and entities has to be respected. Different colours and format text can be also used to underline differences and to facilitate the reading. The adopted graphic solution for the diagram has to be graphically clean in order to communicate information in a clear and immediate way, i.e.: there must not be to many components and no cross lines can be drawn. For this reason it is highly suggested to draw several diagrams instead of only one where all the information could be contained. At the same time, the diagram has to represent exhaustively the system or part of it.

The example on figure 2 shows that with the decomposition phase, 38 entities were identified. Each

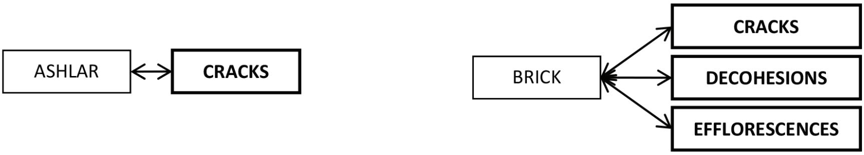


*Fig. 3. Association diagrams schematize the relationships between functional components and weathering patterns.*

of these was located in a specific logical position of the system and functional components were distinguished from materials ones (19 functional component and 19 materials). A first architectonic (see functional) profile was defined, as well as the relationship between materials and functional components. Succeeding in implementing well this first phase allows the surveyor to have a more defined idea of the archaeological/architectural and conservation context that he or she is analysing for the first time.

Besides, the diagram of figure 2 shows that the system is composed by four *classes* of materials (ceramic, mortar, earth and stone), specifically five *typologies* of stone are recognised; finally the stone 2 is the same for some three functional component (threshold, beam 1 and 2). The three mortars which compose the "plaster" on "wall 3" are not the same which compose the "structure" of the same wall.

This example also suggests that in this preliminary investigation phase, it is not necessary to identify the nature of the materials in order to be able to speak about it. It will be for scientists to deal with this later (if necessary!). Likewise it is not a real limit not to know the technical terms to mention the different functional components or materials observed. They can be simply numbered.

Third step: identify horizontal connections. As previously mentioned they comprise the association state between two (or more) different subsystems (or entities) at the same abstraction level. Horizontal connections are important because they force the surveyor to distinguish critical physical links between two different subsystem combined for some functional reason. It is the case of a "plaster" with the "structure" of the "wall 3" or the case of the "bricks" and the "ashlars" which are physically combined thanks to two different "binders" (the "mortar 1" and "mortar 2").

Fourth step: describe the *attributes* and *behaviour* of the elements. In some particular cases, it could be necessary to describe more each component in order to better understand the system and what happens within it: their physical features, role in the system, vulnerability, etc. How to do this without chemical or mineralogical analysis? How to do it without specific skills on materials identification and on construction techniques? Borrowing the principles and techniques from the *Object Oriented Analysis* (OOA) methodology and the *Unified Modelling Language* (UML) both used by computer scientists, a single entity is further decomposed in two subclasses of information: attributes and behaviour; in other words: "what it is" (i.e.: colour, shape, measures, weight and some other physical visible features) and "what it does" (i.e.: it support the wall, it compose the arch, etc.).

Fifth step: create a model for *weathering forms*. The system is not only composed by functional and materials component. The decay and alteration forms (weathering effects) are parts of the system as well! They are present in the system, they have modified the system and they continue to do it along time, they act in the system becoming part of it and conditioning its life. Then OVO suggests detecting these by using the same organized approach used for functional and material components (see raw list and hierarchical diagrams steps) and combining this method with the traditional one which includes the use of glossaries and schemes as, for example, the *"Illustrated glossary on stone deterioration patterns"* by ICOMOS-ISCS. The *OVO methodology* suggests using glossaries just as a supporting tool during the compared visual identification step in front of the structure or object. This implies that any glossaries that will be adopted will not become the glossary of the case study analysed but, on the contrary, a special glossary will be created, following the standard glossaries principles (organization and terms). The examination phase of the state of preservation is implemented and eventually completed with a traditional mapping decay on paper or with CAD systems or other vector systems.

Sixth step: establish relationships between "original components" and "weathering forms". From this moment the surveyor starts the "elaboration phase". It is still based on the objective data and approach. No hypothesis about construction and condition are still made. By using a "flat" (or "association") diagram approach (Fig. 3) it is possible to record relationships visible by naked-eye between each functional/material component and detectable decay/alteration forms.

Seventh step: it can be considered as an intermediary step between objective and deductive approaches. This time the goal is to reconstruct, step by step, the chronology of the weathering forms. What is the weathering form (not the decay process!) which affected before others that specific component? Still using diagrams and referring to one specific original component of the system, we try to find all the possible chronological sequence combinations between weathering forms through a mental *backtracking process* (Fig. 4).

Eighth step: research of the causes. This is the last step of the *OVO* process. Gradually we have moved from the analysis of objective data (*what you see*) to a deductive elaboration of them until we reach a stage where we construct some hypotheses (*what you suppose*). Thanks to this progressive approach the hypotheses are based on more aware and shareable data. Again this last step is regulated by another borrowed methodology, based on a particular diagram called "cause-effect", "fishbone" or "Ishikawa" diagram usually used in the field of *problem solving*. In our case the problem is the final decay/alteration effect. The surveyor tries to relate the different possible causes to the final weathering effect previously identified. He also can try to find the sub-causes (Fig. 5).

So described the *OVO methodology* may appear very laborious. You might think that it requires a very long time to be implemented. Certainly like any new solution *OVO* requires a time of acceptance, learning and metabolic activity or digestion. At the beginning, in addition to partially renouncing to your own knowledge, experience and *modus operandi*, you will need to spend some time to "re-learn" how to observe and how to elaborate information. Probably at the beginning you will produce a large amount of diagrams (too much) and you will discover that some of them will be wrong or totally useless. Another part of the time will be devoted to calibrate how to use standard glossaries and how to create those specific for your purpose. With time, the sequence of the described process (see steps before) will become gradually more and more automatic: You will observe in a more systematic, objective and schematic way; the list of functional and material components and those of weathering effects will become "mental list"; the diagrams and relationships also will become "mental graphics and links". At this time you will draw only some final diagram for reporting purposes or to share information with other professionals.

The *OVO methodology* has been tested on real cases since 2004, both in the training and experimental fields (ICCROM courses and other didactic experiences) and directly in daily work situations. The results demonstrate that in order to appreciate the methodology, it is always necessary to overcome the critical first period during which normally the mental and professional approach has to be revolutionized. After this, even the most sceptical and traditional (conservative) people show an unexpected enthusiasm: they admit the efficiency of the methodology, they are interested in learning more about it and they look forward to trying it on other case studies known by them.

The educational context is certainly more favourable than the working one: the emotional predisposition of the people and their enthusiasm respecting the learning opportunity are certainly higher. In that case one full-immersion week (theory and application) is enough to obtain the first positive results. The more interesting reactions were detected during some ICCROM courses in different countries. The pioneering relevant applications (2005-2007) were

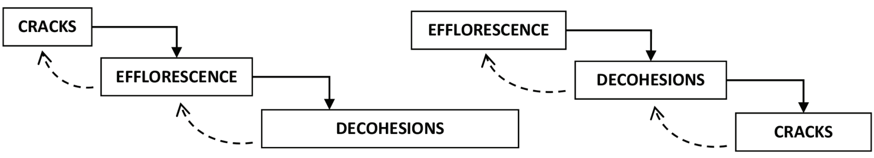


*Fig. 4. Scheme of two hypotheses about the chronology with which the weathering forms could have appeared on the brick (see Fig. 3).*

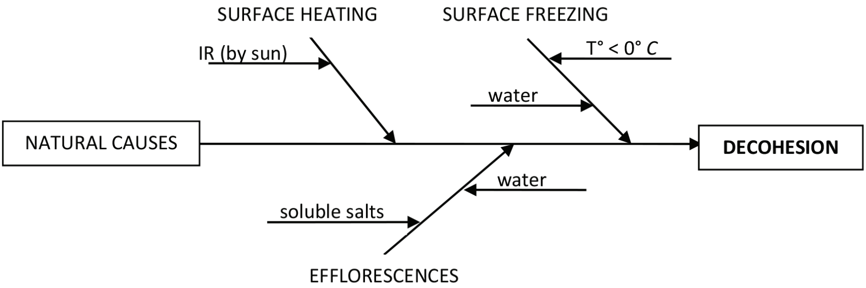


*Fig. 5. The cause-effect diagram shows a theoretical example of some causes responsible for a decohesion effect.*

made thanks to the availability and the foresight of this international educational centre, with particular reference of the "Sites Unit", for the training project for Southeastern Europe, which involved several countries of the Balkan region (Magar, 2006 & 2008). The particular intellectually lively participants of those courses gave the first major and decisive contribution to the development of the *OVO methodology* that occurred in the following years. After that, *OVO* has been improved thanks to another important project managed again by the Sites Unit at ICCROM: the ATHAR project, implemented in Jordan, Lebanon and the United Arab Emirates (2006-2009). The most recent training module was implemented in April 2014 during the course on "First Aid for Archaeological Finds" in Bahrain. Starting from December of 2014, the ICCROM-ATHAR Regional Centre, in partnership with the Ministry of Culture of Bahrain and University of Sharjah (UoS) will coordinate a series of courses for the Persian Gulf countries which will focus on *condition assessment* based on *OVO methodology*. Not least among the forthcoming activities that ICCROM will coordinate in Latin America and the Caribbean there is the LATAM Programme, developed in close collaboration with the *Coordinación Nacional de Conservación del Patrimonio Cultural* (CNCPC-INAH, Mexico). In that case the *OVO methodology* will be adopted in the field of "Stone Conservation" within the LATAM programme (2015-2019).

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*Fig. 5. Organised Visual Observation logo. Image by Corrado Pedelì.*

*Fig. 6. ICCROM participants practicing OVO in Butrint. Image by Corrado Pedelì.*

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