

REHAB 2015

2nd International Conference on
Preservation, Maintenance and Rehabilitation
of Historical Buildings and Structures



Edited by

**Rogério Amoêda
Sérgio Lira
Cristina Pinheiro**

Volume 1

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REHAB 2015

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Proceedings of the 2nd International Conference
on Preservation, Maintenance and Rehabilitation
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Volume 1

*Porto, Portugal
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Rogério Amoêda, Sérgio Lira & Cristina Pinheiro

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Foreword

REHAB 2015 – 2nd International Conference on Preservation, Maintenance and Rehabilitation of Historic Buildings and Structures aims to proceed with the discussion on built heritage and the preservation of its legacy, that was established in the first edition of the event. The importance of conservation of historical constructions (built landscape, urban fabrics, buildings, and engineering works) are of utmost importance to preserve the cultural references of a community and was deeply discussed on March 2014, in Tomar (Portugal).

Under the main topics of discussion, subjects of preservation and rehabilitation methodologies and technologies, as well the importance of the economic and social impacts of preservation practices were covered as the main leading guidelines for the conference debate. Furthermore, different communities' scales (local, regional national or even worldwide) and authenticity interpretation raise different questions and approaches, and therefore different solutions that are worthily to study, to compare and to experience.

The sustainability approach was again covered, highlighting the importance of the commitment between heritage preservation and technical requirements related to its occupancy and use, such as energy efficiency or materials recovery. Inclusivity was also an important aspect under discussion as public historical sites and buildings need to be adapted to receive different kind of visitors (children, elderly or handicapped persons) and to establish an adequacy with the perceiving of the physical environment and information contents.

As a Special Chapter, Historical Centres were brought into a particular approach highlighting the complexity of their preservation, maintenance and rehabilitation. Historical urban fabrics raise unique problems of preservation and promotion, and have highlighted the needs of specific solutions to be applied.

This second edition of the REHAB conference also gave stage to early stage researchers and students willing to share the results of their research projects, namely post-graduation projects and doctoral projects. REHAB 2015 received a significant number of such proposals the quality of which was confirmed by the members of the Scientific Committee. This high quality level encourages the organisers to keep on this path and attract young researchers to have the stage and present their work.

We would like to express our gratefulness to all the partners and sponsors of REHAB who joined efforts to make it a significant Conference. Our special word or recognition to the Municipality of Porto, to the Youth Foundation (Fundação da Juventude) and to the Bureau of Tourism of Portugal - Porto and North.

A special word of gratitude to all Members of the Scientific Committee who reviewed the papers and made suggestions that improved the quality of the individual works and the overall quality of the event.

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Heritage and global resources: Draa Valley in Morocco

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ABSTRACT: A Region defined by geographical and physical boundaries contains a set of element that finds its description in the wider definition of “landscape” word. Draa Valley in Morocco is a landscape characterized by few elements: river, oasis, earthen architecture, Berber communities. A system of elements which over the centuries has created a wonderful Landscape. This landscape and territory generally, nowadays, is in decay advanced state of degradation. This research starts from territory and architecture knowledge and has the aim of Draa Valley physical and intangible heritage valorization. Knowledge phase was completed by implementing advanced technologies survey campaign. Have been surveyed earthen architectures (*igherm* and *tighremt*) and part of landscape. We are now able to make graphic and photographic repertoire. Architecture preservation state is very bad. Earthen architectures, no longer inhabited, are disintegrate under weather actions. Oasis, no longer cultivated, suffers same fate. Heritage education and its enjoyment seem to be correct methods for preservation and valorization of this kind of heritage. This research, in progress, goes in the direction of cultural tourism using a series of methods applied to the territory able to make live life the places. The other side creation of web-platform and structuring of a crowdsourcing, capable of generating an active collaboration between physical places (Valley of Draa) and virtual places (web-site) delegating to a large number of people to the project development.

1 DRAA VALLEY HERITAGE: IGHERM AND TIGHREMT

Identifying *igherm* and *tighremt* in the Draa Valley, cataloging for formal and functional categories, the choice of surveyed examples were the first steps that have highlighted architecture quantity and quality. Landscape sections made it possible to understand the relationship that exists between the village, the house, oases gardens, irrigation canals and the river. Drawing also reveals architecture consistency. Collapsed parts and those which still resist the passage of time. In my opinion, drawings and surveys are starting point for search of useful elements to build vocabulary and grammar forms misrepresented and distorted by inability to read the schedule of this territory. *Tighremt* drawings tell us about family structure and the *Igherm* plan tells us about inhabitants social stratification. This is not popular architecture. Who builds *igherm* is a community and decisions are made by community and religion heads. Who builds a *tighremt* is a rich owner, the head of a wealthy family. The typology is regular, the geometry defined, the décor sumptuous. We are faced with signs that communicate social and religious symbols. Although *tighremt* architecture elements and *igherm* layout are clear and arranged in repeated form; the formal debate on the origin and composition is confused and unresolved.

Igherm is a village surrounded by defensive walls with surveillance towers. Walls are the main element of the *igherm* defense; they generate the fence, a boundary between oasis and desert outer space and the village. Pisè is construction material and its shape could have a sym-

bolic meaning to the social reality of the village. Rows, heights, towers and main door decorations transcribe tribal codes. Plans perfectly aligned, heights proportional at pisè rows, about of 80cm height. Wall height as the thickness derived by the length, since the time of the construction and location. *Igherm* built on plains are low and do not have very thick walls. Wall perimeter on each side is broken at regular intervals by towers, one in the middle, near the front door, two are placed at 2/3 of the length, etc., there are eight in Tissergate. The main gate, decorated, marks village entrance and prevailing direction of village, either inserted in the walls or protruding outer wards. The entrance is one of the invariant features. A part protruding from the wall with an arched door is often preceded by an L shaped wall. The entrance is a rectangular room divided into two parts: one part on the porch with arches and raised benches, the other the road that leads inside the village. Stone benches, jars for water and fire for tea, the entry assumes the function of meeting place where meets the most important people assemble and in which travelers and merchants are housed. A second door leads into a large open space, where there is the market, the assemblies and celebrations. Here there is a place for animals, the common storage for cereals, tanks and the guardian lodging. From this open space the road begins. The main street, wide and straight, divides the residential neighborhoods. Near the entrance and the square small craft shops, bakery, fonduk, the mosque are located. Outside the walls is the cemetery with the mausoleum and near a large free space for nomad caravans on market days. All around are the agricultural fields that are redesigned on a wider scale according to the social structure of the city. Sacred place, into *igherm*, is a complex architecture that includes: a prayer room, ablution rooms with cistern and baths, fireplace to heat water, ladder to reach the terrace from where the muezzin calls to prayer. Mosque size varies according to the size of the village. *Igherm* roads are spaced between the houses, they have no other function than that of the giving access to the neighborhood, providing privacy and security. Roads going in the district are closed using gates at night.



Figure 1. Draa Valley Earthen Architecture: tighremt.

Road structure is minimal. Streets are narrow and blankets from the upper floors of the houses, covering them create shadows. Houses are arranged next to each other simply juxtaposed.

The rule of proximity fulfills the imperative of the occupation of the smallest possible space. Each neighborhood is distinctly separated and organized into hierarchies, for example the ethnic neighborhood of Jews, the notables, the slaves etc. and each occupies a privileged position regarding the mosque, the front gate. The igherm house is a courtyard type. Houses develop in height. When igherm reaches its maximum size, the expansion takes place outside, erecting walls juxtaposed on previous units or constructing another nearby. Some of wealthiest families choose to break away from the group and found independent units these are tighremt.

2 GLOBAL RESOURCE TO SAVE DRAA VALLEY HERITAGE

UNESCO Convention (1970) says that the Cultural and Natural Heritage is in danger of destruction, not only for the natural causes of decay, but for the evolution of social and economic life that attacks the assets with the phenomena of destruction more.

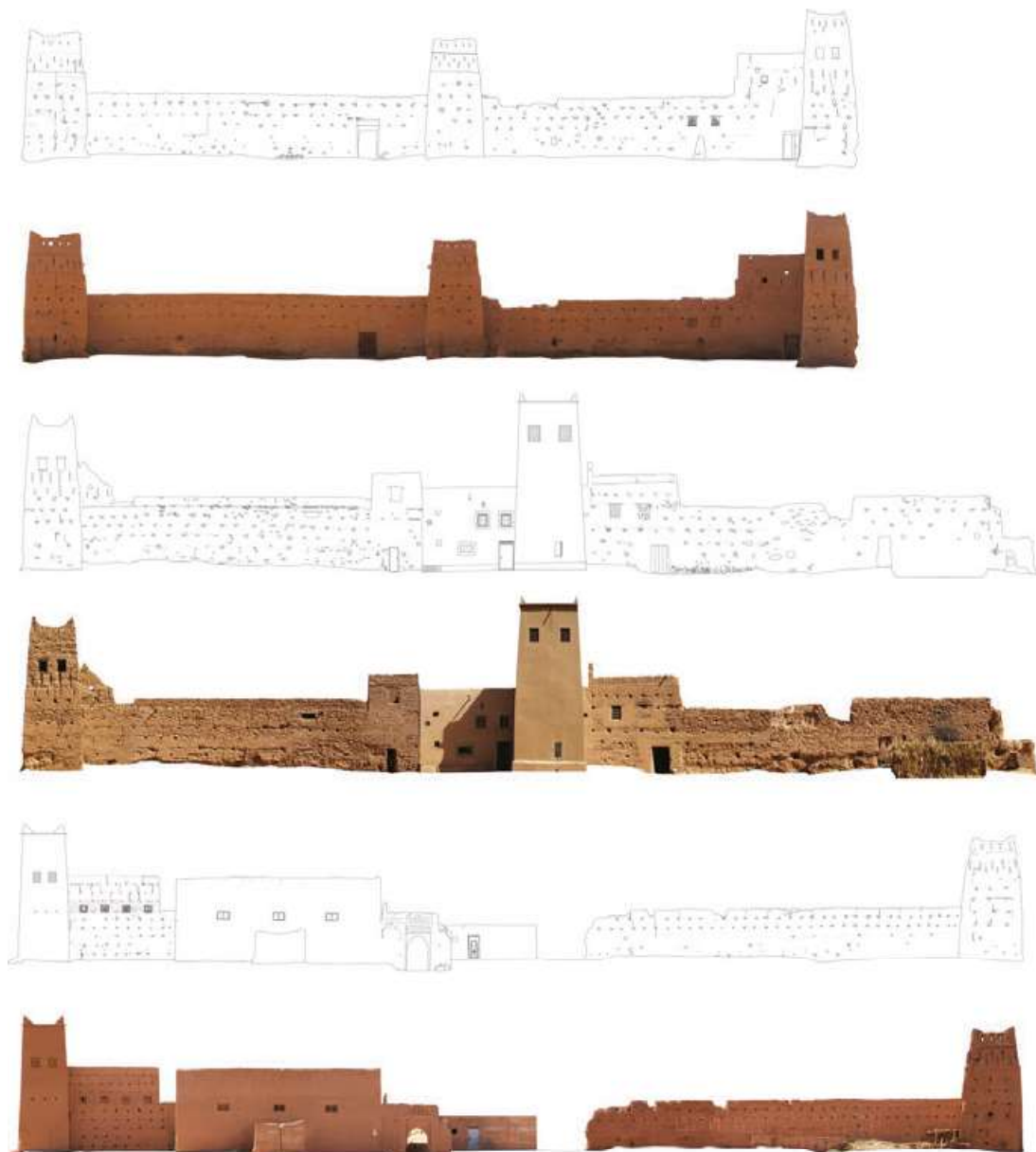


Figure 2. Igherm Ayt Issa o Brahim: survey.

On the one hand the increase of mass tourism involving Morocco by the end of the twentieth century led to acts of speculation. This has produced a series of restoration and transformation of the kasbah in restaurants, hotels, etc. Have been made new buildings used as new hotels or public offices. There is talk of a post-kasbah style: “utilisent les formes du passé avec des procédés actuels. [...] Ils prennent une forme identifiable, qu’ils habillent de motifs emblématiques, et fabriquent un objet archétypal, sentimental, porteur d’une revendication générale, collective et esthétique [...] répond à toutes sortes de besoins, nouveaux, standardisés. Le désir d’expression prend le pas sur le rationalisme [...]. Ainsi, plus qu’un régionalisme, le style post-kasbah est une forme pastiche facilement identifiable”. On the other hand new places obey the rule of improvisation. The ‘put-next’. Adding elements of modernity without rules. Side by side to the regular space, coded and homogeneous of the ksar, there are a number of heterogeneous villages, result of new social behaviors. Yet the French architects of rationalism style had shown a proper methodology regarding the identification of archetypes and their transcriptions Modern Movement language. The project archetype "kasbah" is clearly expressed in the kasbah-housing or in the corner solution of the tower of a new mall.

The landscape, between Agdz and Tamegroute, south of Zagora, is linear and continuous: a green band little more than a kilometer, plows a valley with a constant morphology and cross section with few elements that characterize it.

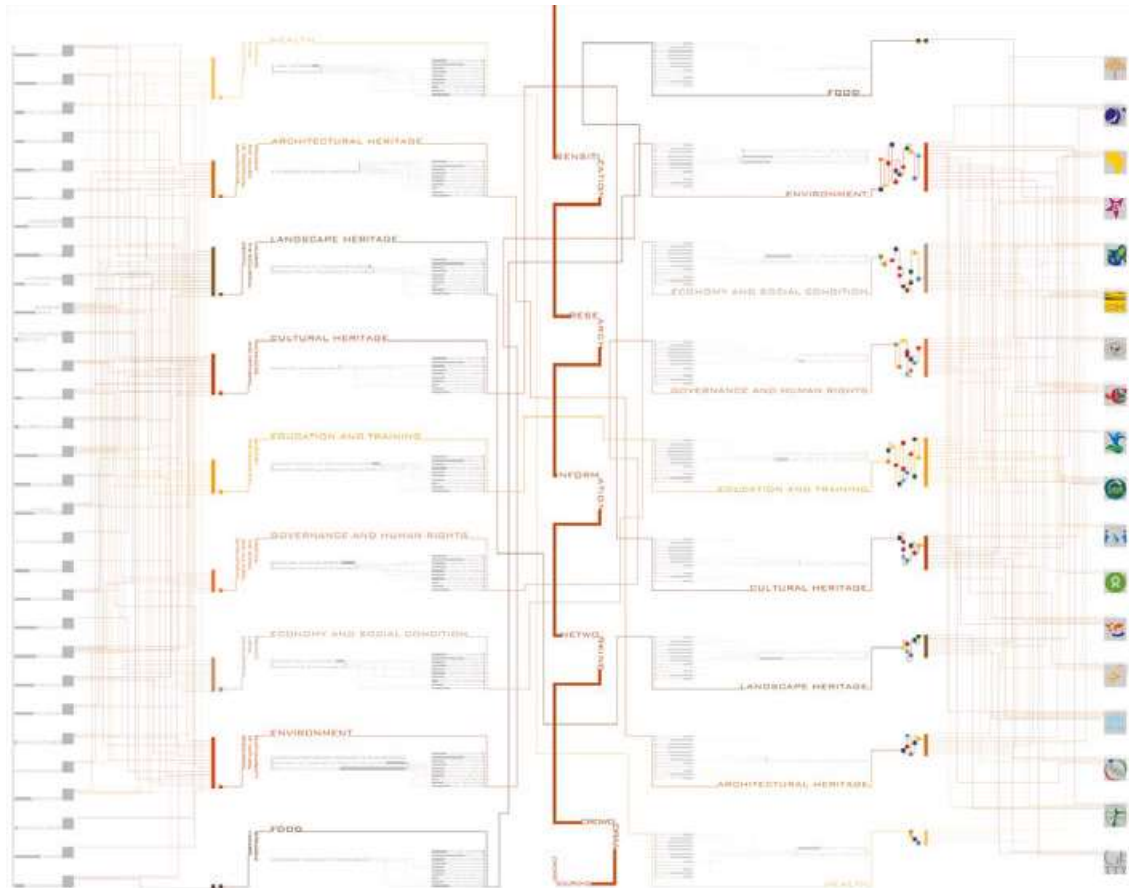


Figure 3. CroudSourcing Framework.

The geography of these places is drawn by water. The river separates the two edges of cultivated land; at regular intervals, the ancient Berber settlements, are distinguished by the color contrast and texture. Now new agglomerations incorporate the ancient villages abandoned and crumbling. Or are flanked in anonymous compositions. Along the valley there are more than three hundred of ksour, or igherm, and kasbah, or tighemt. The water builds a landscape of essential elements: the river, the oases, the architecture. The variation of one element leads to

the alteration of this environment. The three elements are repeated in their uniqueness, in their essence, in the capacity to accommodate human groups. They create streams of things and people moving, once, from South to North, transporting merchandise and people from sub-Saharan Africa, Niger, Mali, Mauritania. Today people move in the opposite direction transiting from north to south, carrying “modern” materials, bricks, clothing and plastic containers. Few are, now, the things that the South exports towards North. In this way there seems to be a loss of memory and constructive knowledge. New materials, modern and cheap are used, materials that do not require frequent maintenance, which “withstand time” This loss of memory is also a lost social identity. This study starts from territory and architecture knowledge and has the aim objective of safeguarding and valorization Draa Valley. Focus is cultural memory safeguarding through heritage divulgation and dissemination in order to generate, not only, cultural tourism, able to increase economy, but, and above all, community awareness through heritage education and cultural identity propagation. This is possible building a number of key actions able to “make life places”. At Faculty of Architecture of Reggio Calabria in the Final Synthesis Laboratory and Final Atelier, conducted by Marinella Arena and me, has prepared a program of architecture survey and a digital tourism project for Draa Valley heritage governance. With students, for three years, they were surveyed earthen architecture, *igherm* and *tighremt*, in order to build an exhaustive graphic and photographic repertoire; architecture identification, cataloging and mapping able to declare architecture condition and establish the “ground zero” of the Valley, the program start point. Landscape and architecture condition is bad. Earthen architecture no longer inhabited are disintegrate under atmospheric agents actions.

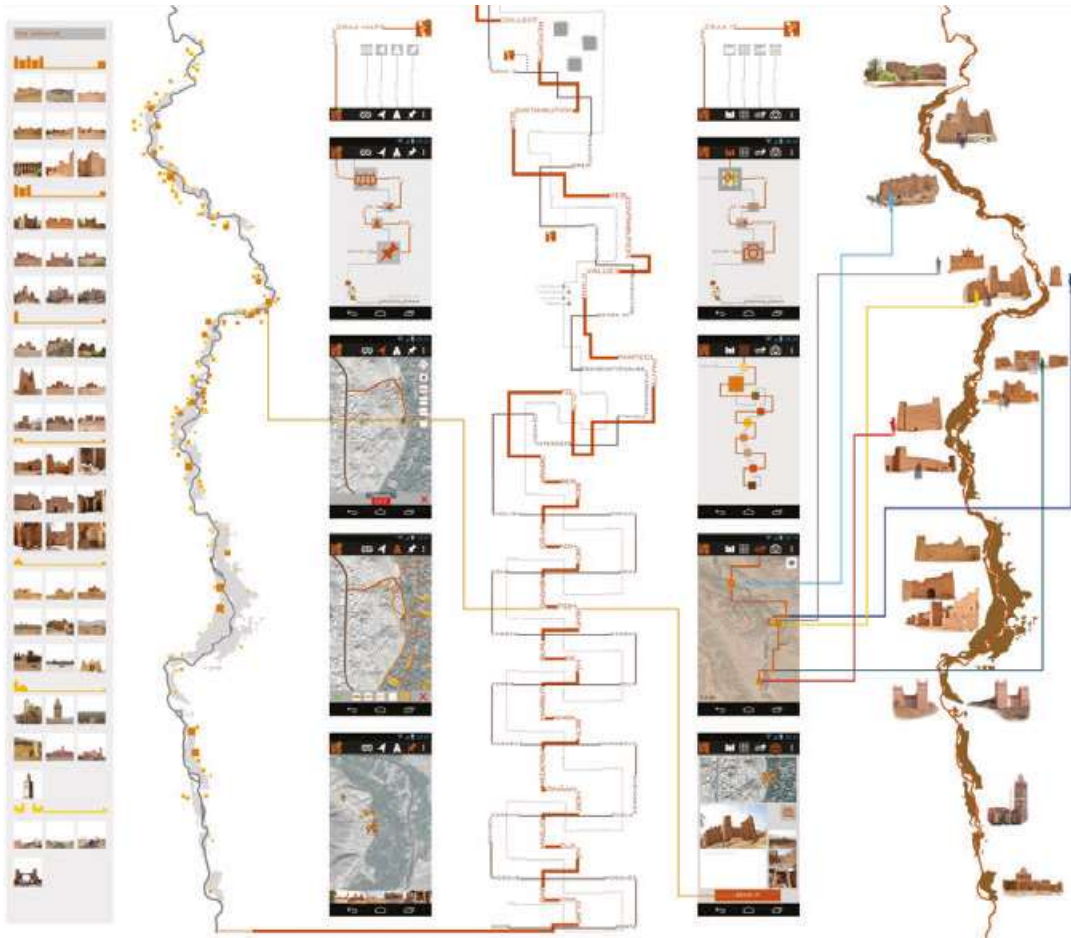


Figure 4. CroudDraa Map.

The oasis, no longer cultivated, suffers the same fate. Heritage education and its use seems to be the correct methods for heritage preservation and valorization. *Igherm* are near water source;

this ensured oasis cultivation and city survival. In the Draa Valley, as in other valleys, *Igherm* and *Tighremt* are located left and right of the river, forming a linear network of visual correspondences that allow rapid and effective communications, not only for military and defense issues, but for warnings useful for water distribution, caravans arrival, etc. Draa Valley ecosystem is defined by a set of elements that maintain close balance relationship. The alteration of one of these elements affects the stability of the entire system. Igherm and tighremt model is recognizable and clear. The analyzes regarding installation, space arrangement, morphology, full and empty, housing typology highlight the repetition of shapes and elements. Show the relationship with the land, with the oasis, the gardens, irrigation canals, the balance between the living space, the space grown, the water and the desert. Education and safeguard program expected to produce digital platform based on crowdsourcing system, capable to generate active collaboration between physical place (the Draa Valley) and virtual places (web platform) delegating a large number of people to program development. Crowdsourcing is the composition of two words, "crowd" and "outsourcing" definition that in economy means business "assign out-source part of activities".

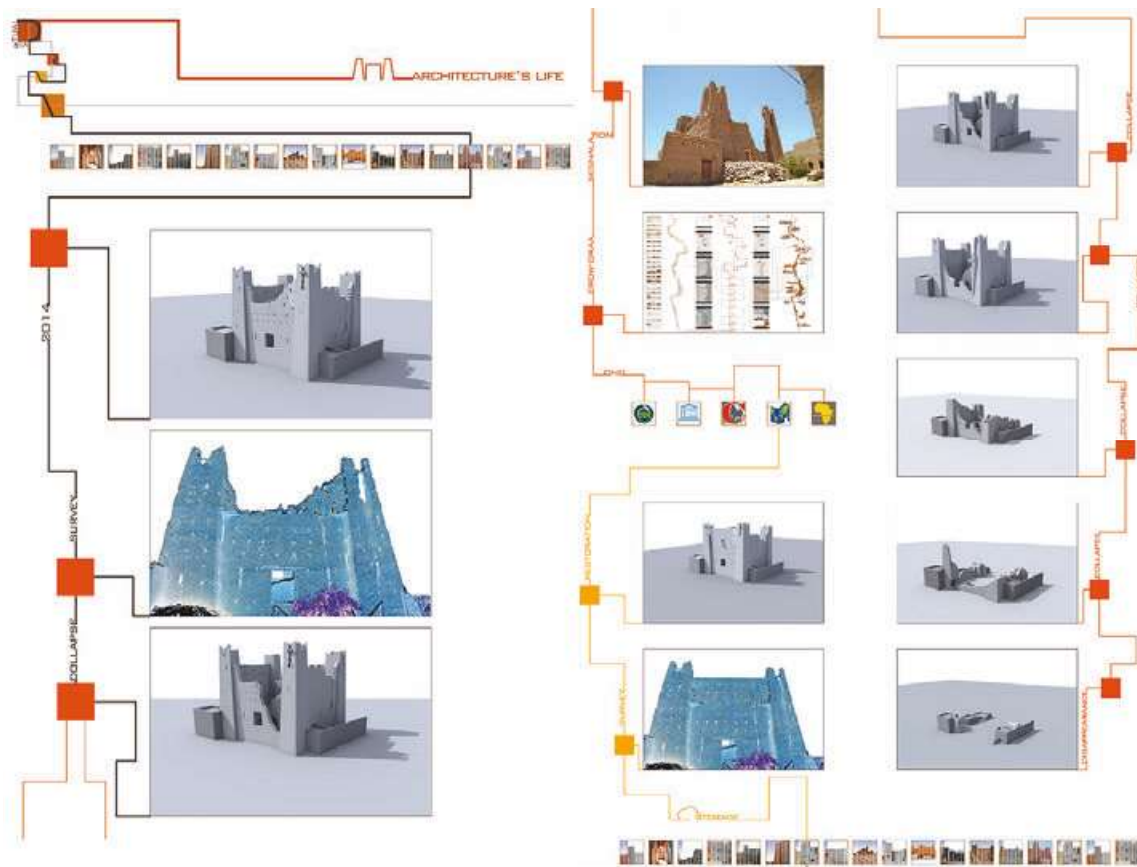


Figure 5. DraInCloud: architecture monitoring.

Crowdsourcing is the practice to consult the virtual community for seeking input able to provide answers to questions posed. Consults web-people to collect informations, ideas, solutions, etc. A crowdsourcing platform, by its nature, involves the participation of different professions categories, in practice of all the people of the web can attend the call. Main difficult is to select digital-audience to be involved. Put attention only one focus, such as architecture, becomes extremely simplistic, because system potentiality can offer much more. So in addition to "heritage" you have chosen to include, in the web-platform, focus concerning education, training, awareness for heritage education, economy derived and / or increased by tourism, that can be implemented during the time. Digital-audience is mainly composed of three categories of users / target: local residents, visitors, web-people. Platform construction, in addition to the structure

construction, involves placing in storage, the archive, a multitude of data regarding the current state of architecture and tangible heritage. Photos, video, drawings, scientific survey, 3d models, architecture CloudPoint models, infographics, geotag, mapping, etc. In addition to the initial data entered by our subject, local target, comprises associations, ONG, tour operators, scholars, operating on Moroccan territory and which shall collect and enter information into the storage. Information entered in the platform will be organized in Crowdmap, interactive systems, continuously updated, designed for the output of all new information for the digital audience. Depending on the specific nature of internet user, will include information that will complement/update storage, enabling exchanges and sharing of content. The involvement of citizens, administrators, organizations, associations, students, is feasible through an awareness process to heritage and cultural education. In this way every inhabitant that is near architecture, identified and listed as heritage unit, will report in real time on the state of variation or deterioration. Information entered by digital-people are different and heterogeneous. It need of "quality filters" inclusion, and operators careful selection, for ensure data quality. Web-platform is divided into sections that collect and send data belonging to a specific category. Interaction tools between web-platform and audience are smartphones, tablets applications that let you enter information in real time. First time activated section are: Crowdrra based on crowdsourcing; DraaInCloud uses new technology to document architecture conservation state and detects change or degradation in real time; DraaToSearch allows to search documents through image recognition; ImageFinder, WordSearch and GeoMapping. CrowdDraa is based on shared common memory by future generations. AppDraaIt is smartphone application using geotag service.

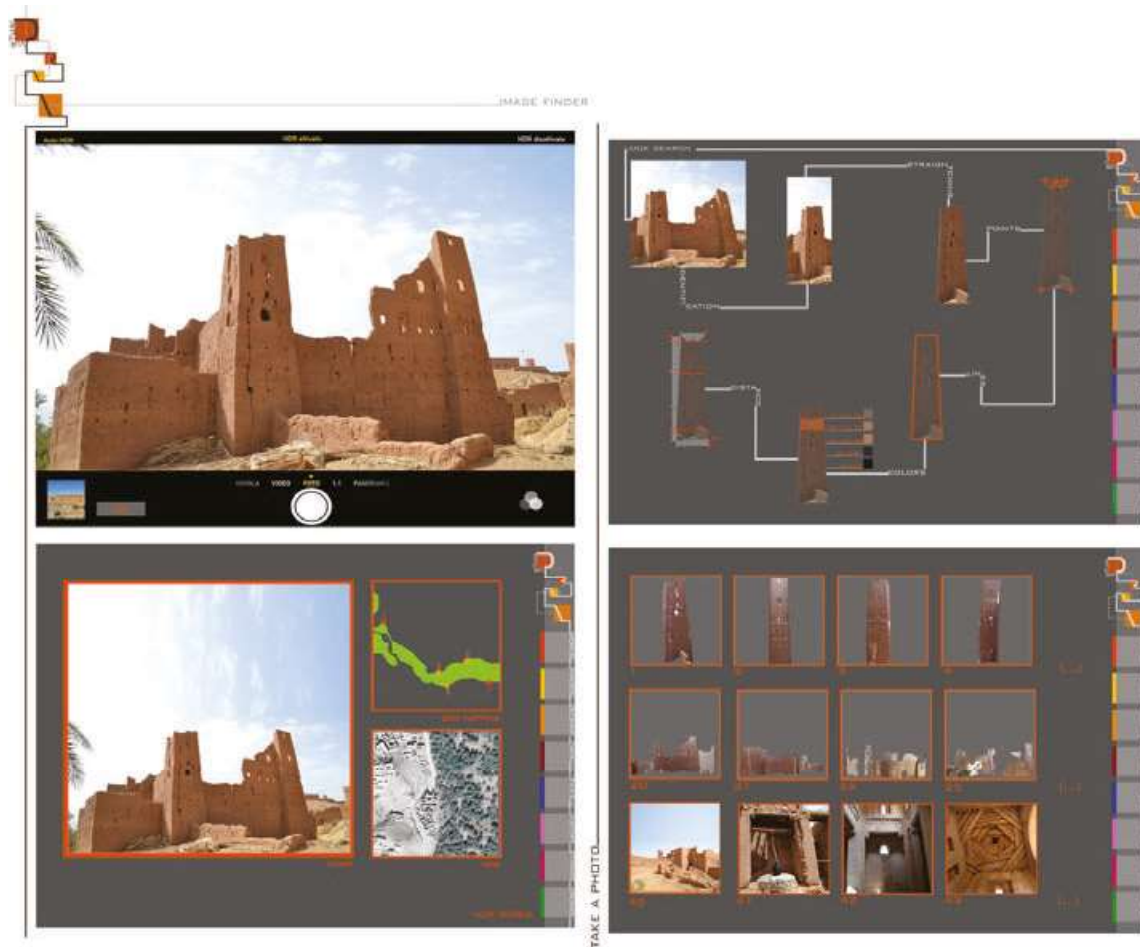


Figure 6. Take-A-Photo.

App is used to connect to geo-referenced system. It is possible select interest focus, report on the map by images or descriptions. Received data will be reordered and organized in Crowdmap. Linking together all information, with those already stored, it increases web-platform. App that web-platform makes available to users is AppDraaMaps.



Figure 7. DraaToSearch: WordSearch.

It provides location, routes, accessibility, history, architecture quality, and more of architecture, and more. DraaInCloud creates opportunity to strengthen architectural heritage documentation, by survey advanced techniques, through data by photos capable to create pointcloud model. Informants are divided into two categories: tourist / citizens, a category of people not interested in the technical issues of architecture, and a category of people who are sensitive to survey techniques. For the first category provides for the possibility to hire devices such as smartphones, tablets, laptops, containing GoogleGlass a new generation devices. During journey, an app will notify when you are near igherm or tighremt. This allows you to browse data in the storage and compare them with reality. If at the time of the confrontation were discrepancy between real and data contained in the web, it is possible notify it by photo sent to platform. "Survey-tourists", unlike simple tourists, agree to receive an assignment and to carry out survey service. Accurate photographic survey is useful to update digital models and check architecture conservation state. GoogleGlass use augmented reality glasses. App guides to place and calculate number and shooting modes. Photos are sent to the storage placed in CrowdDraa system. DraaToSearch allows access to documents, images, videos, drawings present in the storage. This session allows image search through similar images. Take-a-photo allows to take a picture in the same position as others on the web. First you start the image recognition, method used in web. It is by points, lines, colors and distances between points. In this case, made access to CrowdDraa, images-finder, you can select a type of search, and upload an image present in the tablet, PC, etc. The image is processed, system will recognize the item searched and find main lines points, color will be recognized by the color codes used and finally the distances and the measures of the element sought. They will be selected all documents in storage related to the

element: photo, video, drawings, location coordinates, geomapping connection and word-search. A very important system function is very degraded or missing image loading. Web-system will recognize degraded element and will be able to give an hypothetical reconstruction by connecting all information like on the platform. This process helps to advance predictions about the state of degradation operating from entered data.

ENDNOTE

This work is part of research entitled “Central High Atlas: Igherm and Tighrermt” coordinated by Marinella Arena and Paola Raffa. “Digital tourism” is part of final thesis elaborated by R. Grasso, D. D'Amico, A. Lauria, V. Musumeci, M.C Grasso, G. Fazio at Mediterranean University of Reggio Calabria (tutor M. Arena and P. Raffa). CrowdDraa by Rosaria Grasso and Domy D'Amico. DraaInCloud by Alessandro Lauria and Veronica Musumeci. DraaToSearch: Take-a-Photo by Claudia Ingegneri. GeoMappingSearch by Maria Chiara Grasso. WordSearch by Giusy Fazio.

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