

Dealing with evolving conservation principles to include interdisciplinary collaboration for cultural heritage preservation.

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ABSTRACT:

The preservation of cultural heritage requires the input and collaboration of experts with diverse disciplines. Therefor the various involved actors need to understand and agree on the principles that contribute to the preservation of the identified heritage values. Experience with teaching interdisciplinary groups of students to develop a conservation and valorisation project in the Master of science in Conservation of Monuments and Sites (MCMS) at KU Leuven, helped developing a methodology that stimulate and improve interdisciplinary collaboration in the field. The importance of interdisciplinary collaboration results from evolving concepts on the preservation of built heritage over time. These evolving concepts are reflected in the timeline of the guiding documents; they show the increasing needs of interdisciplinary collaboration. Starting from the development of the "Analysis – Diagnosis – Therapy – Control" method, a series of working instruments have been developed and tested in an interdisciplinary master program and in collaboration with others, including within the PRECOM³OS UNESCO chair to respond to the challenges posed in cultural heritage preservation in interdisciplinary teams and to facilitate interdisciplinary collaboration.

Keywords: structural conservation, interdisciplinary collaboration, ADTC methodology

INTRODUCTION

Today a holistic approach for the preservation of cultural heritage is common sense. It often requires the input and collaboration of experts with various disciplines but also a wider community of involved stakeholders. Therefor the various involved actors need to understand and agree on the principles that contribute to the preservation of the identified heritage values. Based on my experience with teaching interdisciplinary groups of students to develop a conservation and valorisation project in the Master of science in Conservation of Monuments and Sites (MCMS) at KU Leuven, I share a methodology and lessons learned that stimulate and improve interdisciplinary collaboration in the field. Over the period I have been involved in academic activities, a short reflection is given on the evolving thinking about such interdisciplinary research and collaboration and how this translated in tools that can be used in education and by professionals.

To that end it is clarified how and why concepts on the preservation of built heritage evolve over time. These evolving concepts are reflected in the timeline of the guiding documents; they show the increasing needs of interdisciplinary collaboration.

Indeed, working on cultural heritage preservation in interdisciplinary teams -even on resolving technical problems as structural repair- requires common understanding and working tools such interdisciplinary collaboration.

BACKGROUND TRENDS: LONG WAVE THEORY AND MULTILEVEL PERSPECTIVE.

The Soviet economist Nicolai Kondratiev (1892-1938) came up with the long-wave theory. He used periodisation to postulate long arcs of economic development, marked by bursts of innovation, followed by stagnation and crisis. Such waves lasted 40 to 60 years, he said.

In 1981 Eric Hobsbawm (Hobsbawm, 1981) wrote of Kondratiev's theory: "That good predictions have proved possible on the basis of Kondratiev long waves — this is not very common in economics — has convinced many historians and even some economists that there is something in them, even if we don't know what".

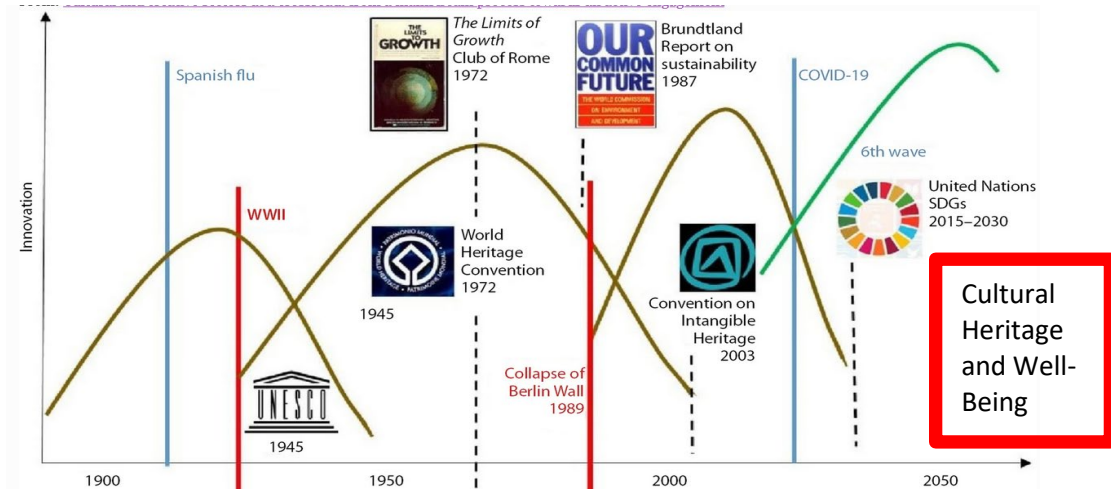


Figure 1. Waves of innovation with the cultural built heritage modified by the author based on (Ost & Saleh, 2021)

Closer in time and to the subject of our talk we find the concept of the multilevel perspective (MLP) which is based on insights of evolutionary economics and technology studies. It views transitions as non-linear processes that results from the interplay of developments at three analytical levels (Rip & Kemp, 1998) (Geels, 2002):

- Landscape: the wider context, which influences not only the technical and material backdrop that sustains society, but also includes demographical trends, political ideologies, societal values, and macro-economic patterns.
- Regimes: a collection of existing systems with established practices and rules.
- Niches: the place where innovations take place.

Niche innovations become implemented in the regime ("upscaling") if ideas and visions become more precise and more broadly accepted, if the alignment of various learning processes results in a common framework, and if networks become larger.

Figure 2, provides an ideal-typical representation of how the three levels interact dynamically in the unfolding of a system change. Although each transition is unique, the overall pattern is characterized by transitions resulting from processes at different levels:

- changes at the landscape level create pressure on the socio-technical regime;
- destabilisation of and lack of confidence in the regime creates windows of opportunity for innovations;
- niche-innovations become widely accepted.

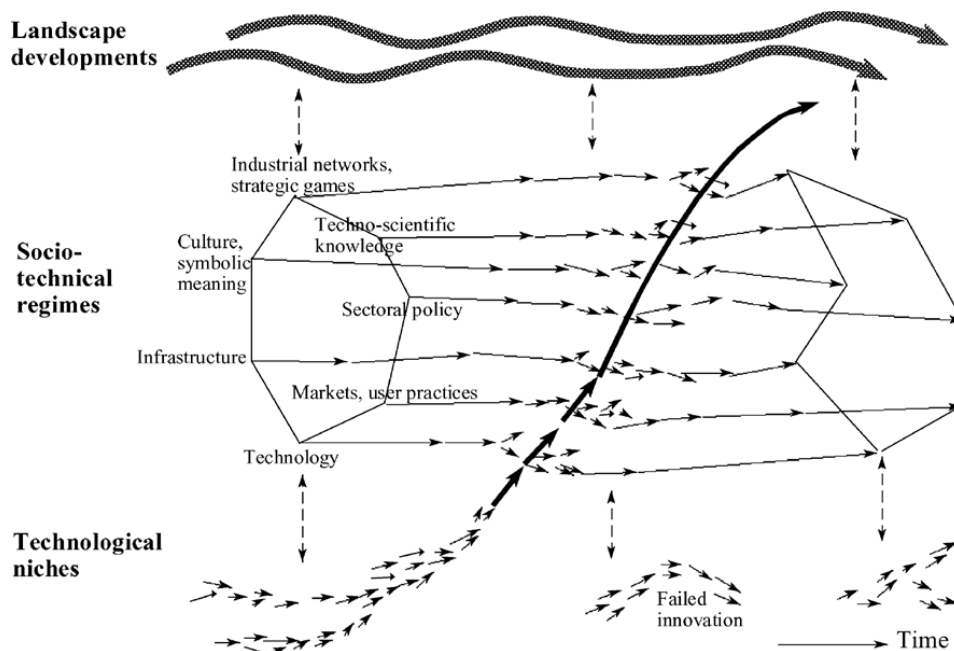


Figure 2. Multi-level perspective on transition theory (Geels, 2002, p.1263)

According to (Rotmans et al., 2001) the unfolding interactions can be further sub-divided into several phases: emergence, take-off, acceleration and stabilization. Each of these phases can be linked to particular mechanisms (Geels, 2002). It implies that the MLP does not accept simple causality in transitions.

Wave theories of change and MLP help understanding why and how ideas in a certain domain (but also at another scale and more materialised in industry) evolve over time.

It helps to evidence how the way we think and collaborate in a field as structural repair of historic buildings we have evolved from a very material and technical evaluation and approach towards a more holistic and multi-disciplinary approach, not because only our technical insights but also the context we operate, have changed.

Particularly in the field of cultural Heritage Christian Ost and Ruba Saleh (Ost & Saleh, 2021) have superposed Nicolai Kondratiev's wave theory to moments in history that are meaningfully linked to cultural heritage related events (see Figure 1). I have added to their graph the last box at the right that points to the most recent and significant perspective we saw popping up in the field of culture and cultural heritage recently.

These approaches and perspectives show how insights in the field of cultural heritage adapt to changes in socio-technical regimes that are influenced by a much broader societal (paradigm) shift.

GUIDING DOCUMENTS IN THE FIELD OF CULTURAL HERITAGE:

Since 1931, the preservation of built heritage has been guided by key international charters and documents.

The two most foundational documents are the Athens Charter from 1931 and the Venice Charter from 1964:

1. Athens Charter (1931):

The first international effort to establish general principles for the preservation of monuments. The participants of the First International Congress of Architects and Technicians of Historic Monuments emphasized the importance of the surroundings of monuments and advised reburial excavations that could not be immediately restored. It also approved the judicious use of modern materials (like reinforced concrete) for structural reinforcement. Materials, architecture, urban planning are key components in the guidelines expressed by the Athens Charter.

2. Venice Charter (1964):

To this day, this is the most influential framework for the conservation and restoration of historic buildings worldwide. The participants of the Second International Congress of Architects and Specialists of Historic Buildings in 1964, aside initiating the establishment of ICOMOS,

introduced in the “Venice Charter” concepts like minimal intervention and the preservation of the authenticity of original materials. This charter amongst other dictates that restoration must be an exceptional act and that any additions must be recognizable as contemporary to avoid falsifying history. On top of the key components mentioned above in the Athens Charter, the Venice Charter also adds history, archaeology, art history as relevant knowledge domains.

After 1964, the focus shifted from individual monuments to historical cities and landscapes. Later a focus on people and communities was added which also led to a more integrated vision on movable, immovable and immaterial heritage. This more holistic vision is also enlarging recently, acknowledging that the divide between culture and nature should be overcome and that cultural heritage contributes to sustainable development and to well-being.

Table 1. Evolving guiding documents and milestone years in Europe

1975	The <u>European Charter of the Architectural Heritage (1975)</u> introduced "integrated conservation," where heritage plays an active role in urban planning and society.
Milestone 1975	European Architectural Heritage Year. “A monument does not stand alone”
1979	<u>The Burra Charter (1979/2013)</u> , which saw light within an Asian and Pacific context, emphasized "cultural significance" (value to the community) rather than just the physical structure.
1994	<u>An attempt to integrate difference in perspectives in Western and non-Western cultures; the Nara Document on Authenticity (1994)</u> acknowledges that authenticity is culture-dependent, which helps to position non-Western traditions that involve reconstruction. It also helped to understand the different layers of significance that make up the concept of authenticity.
2005	<u>Faro Convention, adopted by the Council of Europe in 2005 (in force 2011)</u> , establishes that cultural heritage is a human right, central to society, democracy, and sustainable development. It moves beyond mere preservation of objects to focus on the value people, communities, and society place on heritage. It emphasizes a "grassroot" approach, encouraging public participation in heritage management.
2015	The landmark study <u>“Cultural Heritage Counts for Europe” (2015)</u> has evidenced that cultural heritage is an important driver in society contributing to sustainable development. Through the “upstream approach”, the document revealed that aligning cultural heritage with other resource streams, the outcomes of the later are more sustainable.
Milestone 2018	European Year of Cultural Heritage. “Our heritage: where the past meets the future”
2008-2022	With the <u>PRECOM³OS UNESCO chair</u> which I have chaired from 2008 until 2022, various publications have presented and argued why preventive conservation is a new management approach for built heritage preservation (Vandesande et al. 2018).

The flow of foundational documents in the field of cultural heritage reveals more in detail how the understanding of built cultural heritage has evolved from a material-oriented preservation approach to a cyclic, integrated and holistic process which can be superposed on the various transitions occurring in society at large (see above Background trend).

In the following part, I will use my own experiences and evolving considerations at the Raymond Lemaire International Centre for Conservation at KU Leuven to point towards adapted instruments and approaches we have developed to facilitate interdisciplinary collaboration in the field of the preservation of built heritage.

FROM RESOLVING A TECHNICAL CHALLENGE TOWARDS ADDRESSING HERITAGE VALUES

After my graduation as an engineer-architect in 1979, my interest for the preservation of built heritage was triggered by my wondering about the origin of the design and construction logic that we took for

granted at that time. The wondering was also inspired by the courses of architectural history and heritage preservation -still compulsory courses in the engineer-architect curriculum at the university of Leuven- we received from the late Professor R.M. Lemaire (1921-1997).

The spark that really launched my academic work in the field, came from my experience during the first phase restoration of the Our Lady Cathedral of Antwerp, wondering how it could have started with so much lack of information, leading to substantial unforeseen structural interventions. It happened that I received various entrances in the field of heritage preservation in Flanders in the early eighties which provided me sufficient information to understand what was at stake, to understand the challenge and to initiate a more profound reflection.

The first phase of restoration of the Our-Lady Cathedral in Antwerp (1965-1983) and its context.

Taking aside the "restorations" à la Viollet-le-Duc in the XIX^eC, in the XX^eC there had been some attempts to start restoring the interior of the Our-Lady Cathedral in Antwerp. Giving it back its "glory" was a principal objective, leading to a first interior restoration campaign of the main nave (and collaterals) of the church between 1968 and 1983.

The perceptions of the architect restorer, of the supervising authority and of the supervising committee was embedded in the thinking of that time. Heritage values were assigned by architects and art-historians on the "authenticity" of construction materials, with much less attention for the history of the cathedral's interior decoration, overseeing the very different appearance many churches "originally" had with coloured finishes.

This attitude and approach were not exceptional in Belgium in the eighties. For the Cathedral of Antwerp, Prof. R.M. Lemaire's restoration note of 1963 still echoed earlier voices on preservation of heritage: *"The Antwerp Cathedral is the last great church in our country that is still marred by the countless layers of whitewash that have been applied to its walls."* As early as 1946, he had written that the cathedral *"will gain much in beauty when it is freed from the numerous and dirty layers of whitewash under which it is camouflaged. It is built in beautiful, warm-coloured Brabant sandstone, but the limewash prevents the construction from expressing itself and it takes away all the nervousness and liveliness."* (translated from: Aerts, 2015)

So, it was decided to remove all plaster and lime washes of the pillars to create a church interior with walls of (mostly) visible natural sandy limestone. In the first phase it concerned the central nave and the collaterals of the church. It implied the removal of the old layers of plaster that were in fact repairs on the pillars which were severely damaged by a large fire which happened yet centuries earlier (in 1533 before the central vaults were finished).

A first test restoration of 2 columns in 1968-1969 underestimated the amount of replacement stones that had to be used to restore the pillars and the working method even caused -from a stability point of view- a serious risk. The very disturbed underground with various graves made it impossible to place a temporary frame of scaffolding that would be able to take over, temporarily, the loads on the columns. That's why it was decided to use another provisional strengthening method of the brick core of the pillars, using epoxy resin. The provisional nature of the strengthening was based on the understanding that the epoxy resin injected masonry core would be subjected to creep and thus could lead to more deformations. The use of this technique started in 1974.



Figure 3. Interior of the Cathedral of Antwerp during the restoration of the pillars. The replacement stones are ready to be put back in place after the brick masonry core of the pillars have been injected with epoxy resin to provide it with sufficient carrying capacity to carry the load of the structure on each pillar. (Kinsbergen e.a., 1983, p. 31).

This way of working had serious -so called -unforeseen consequences as for example the strong adhesion of the facing stones to the core of the pillars requiring again other working methods to deal with it. Taking into account such consequences, looking at the lack of integration of the viewpoint of various disciplines, looking at the decision making process which prevailed the “technicians”, I started wondering whether in the second half the XXth C another methodological approach would not have helped saving more of the heritage values of such buildings and could not help to reduce the intrusiveness of restorations.

This initiated my research (in the form of a thesis in 1994 as part of a postgraduate program on the conservation of monuments in Antwerp) that would lead to an approach and a method aiming at integrating disciplines and using monitoring of a construction as a tool to adjust interventions to the required minimum level. I wrote a paper in 1983 on lime paints in historic buildings; therefore, I also became quite sensitive to the value of traditional decorative lime-based wall finishes.

Structural consolidation in monument conservation.

The thesis “Structural consolidation in monument conservation” in 1984 (Van Balen, 1984) led to a publication in the reference Heritage Preservation journal *Monumenten en Landschappen (M&L)* in Flanders (BE) (Van Balen, 1986) parallel with the organisation in 1986 of a conference “Structural Consolidation of Ancient Buildings” for the 10th anniversary of the Centre for Conservation of Historic Towns and Buildings (CCHTB) (which later became the Raymond Lemaire International Centre for Conservation, RLICC). The lectures of the conference were later published in 1988 as “Stable - Unstable? Structural consolidation of ancient buildings”(Lemaire & Van Balen, 1988)

Focussing on the objective this paper, it can be stated that the major contribution of this academic work was the development of **a methodology that identifies the different steps in a systematic approach (Anamnesis – Diagnosis – Therapy – Control) (ADTC methodology)** which was a slight modification of the proposals made by Prof. F. Wenzel (1930-2020) and were shared by him (Wenzel, 1983) as well as by (Beckman & Happold, 1983) in the IABSE reports 46 (1983) at the occasion of the IABSE Symposium on “Strengthening of Building Structures: Diagnosis and Therapy” that was held in Venice, Italy, on September 29-30, 1983.

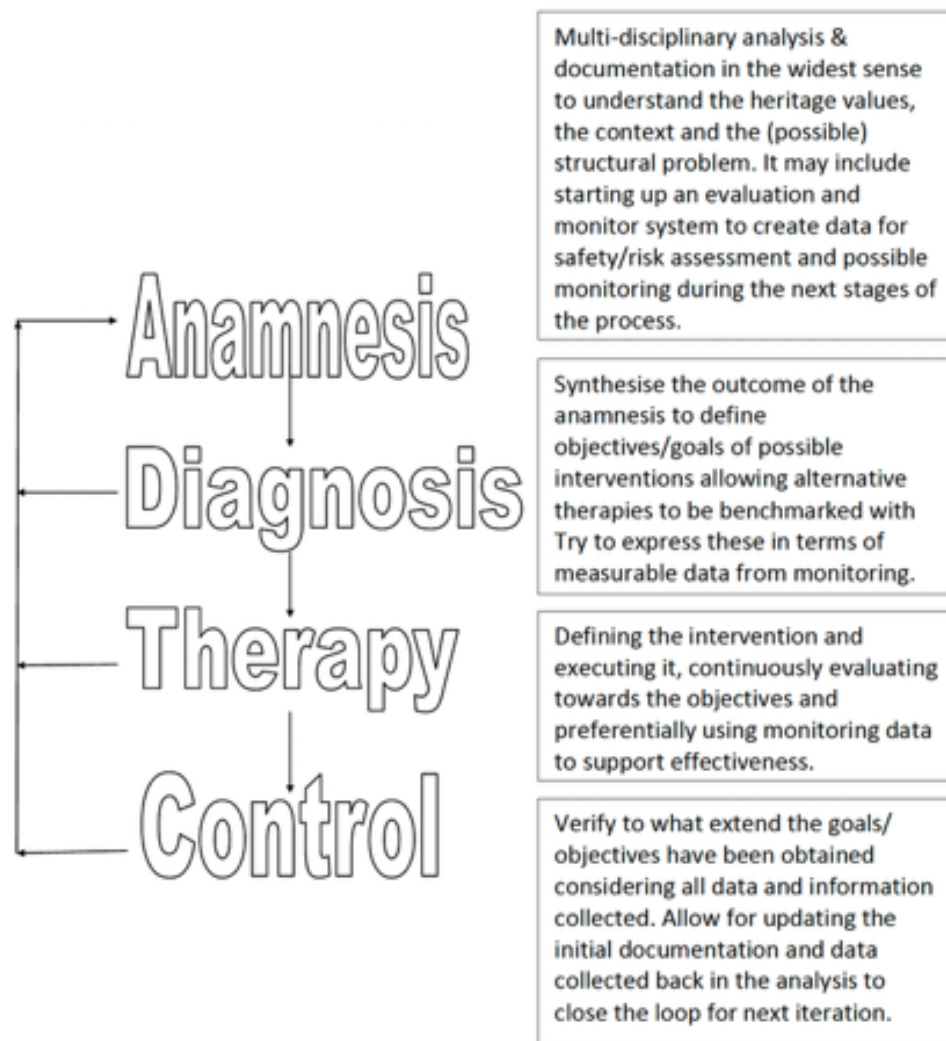


Figure 4. Representation of the Analysis – Diagnosis – Therapy – Control (ADTC) methodology.

It is interesting to mention two differences in the approach compared to the proposal by Prof. F. Wenzel (Wenzel, 1983) who used the terminology Anamnesis – Diagnosis- Therapy -Prognosis referring to the analogy from medicine.

Firstly, the term “prognosis” in a certain sense reveals the linear way of thinking. We changed the term into “control” which still includes the idea of prognosis, but it also allows for the integration of iterative loops and a monitoring approach. The latter is also important to allow the possibility for a step-by-step intervention that helps to implement the required “minimum intervention” and that allows to integrate uncertainties in the concept and the execution of the therapy by evaluating (step by step if necessary) the (intermediate) results obtained, measured towards the goals defined in the diagnosis. A good use of such approach has been used the intervention in the Pisa Tower. The choice was made to straighten the tower (a bit) using an excavation method which was controlled by a monitoring system that measured the change of inclination is (Burland et al., 2009). The approach helped evaluate the effectiveness of the intervention while also reducing it to the strict minimum.

Secondly, reading carefully the article of Prof. F. Wenzel (Wenzel, 1983- and also that of P. Beckmann and E. Happold (Beckmann & Happold, 1983) it is worth noticing the rather “technical only” perspective thrown on the interdisciplinary analysis.

In short, the methodology positions the need for interdisciplinary collaboration in the phase of the anamnesis, and the cyclic approach forces also the review and monitoring through various phases, inviting again the input from various disciplines in an iterative process.

In my 1984 thesis (Van Balen, 1984) the concept was validated through various case studies which were also shared in a paper session at the conference “Structural Consolidation of Ancient Buildings” in Leuven in 1986 (Van Balen, 1988).

In the postface of the Stable-Unstable (1988) publication, Prof. R. Lemaire (Lemaire, 1988) stated that the conference of 1986 “*has shown the interest of interdisciplinary confrontation of studies and experiments for the exposure, the promotion and the coordination of knowledge in this matter. More than ever the need for an organized body and a meeting place for specialists and users has been felt and sustained. ICOMOS who patronizes the activities of the Centre {CCHTB later RLICC} considers it as its tasks to create and support such body to be established as a specialised International Committee. The University of Leuven and its “Centre for Conservation of Historic Towns and Buildings” are prepared to provide the logistic support and to promote the action of such committee*”.

Eventually 8 years later in 1996 at 11th General Assembly “Heritage and Social Changes” in Sofia (Bulgaria), the **International Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH)** was established with Prof. Giorgio Croci (1936 – 2021) as the first president and me as the first secretary-general. The ISCARSAH members jointly authored the “ISCARSAH Principles for the structural conservation of heritage sites”(ISCARSAH, 2014) which were ratified by the ICOMOS 14th General Assembly, in Victoria Falls, Zimbabwe in October 2003.

This cyclic iterative approach with the different phases (*ADTC methodology*), was integrated in ISCARSAH's first guideline documents that led to the ISCARSAH principles.

*Art. 1.6 The peculiarity of heritage structures, with their complex history, requires the organisation of studies and proposals in precise steps that are similar to those used in medicine. **Anamnesis, diagnosis, therapy and controls**, corresponding respectively to the searches for significant data and information, individuation of the causes of damage and decay, choice of the remedial measures and control of the efficiency of the interventions. In order to achieve cost effectiveness and minimal impact on architectural heritage using funds available in a rational way; it is usually necessary that the study repeats these steps in an iterative process.*

Referring to the first part of my talk, it is interesting to note the theme of the ICOMOS General Assembly of 1996 during which the establishment of ISCARSAH was approved: “Heritage and Social Changes” and the one of 2003 when the ISCARSAH principles were adopted: “Place – Memory – Meaning: Preserving Intangible Values in Monuments and Sites”. They reveal a much wider perspective on what is at stake when dealing with cultural heritage today, clearly a mark of the evolving time, leading to an evolving landscape of ideas within which guiding documents on the preservation of built heritage shift. The *ADTC methodology* sketches above, allows to open that perspective in line with the way cultural heritage preservation is approached today.

Later, the same *ADTC methodology* was integrated in the approaches of Preventive Conservation and has guided the research carried out within the PRECOM³OS UNESCO chair at KU Leuven, established in 2008.

The *ADTC methodology* can also be found in the core of various academic contributions that resulted from the collaboration in the PRECOM³OS UNESCO chair. One example to illustrate this is the PhD work of dr. Veronica Herras Barros who developed a GIS based monitoring system with an attempt to extend GIS applications to the 3rd dimension. It was the first PhD that resulted from the close collaboration with the Faculty of Architecture from the University of Cuenca in Ecuador that started in 2007 and was still ongoing when I retired in 2022.

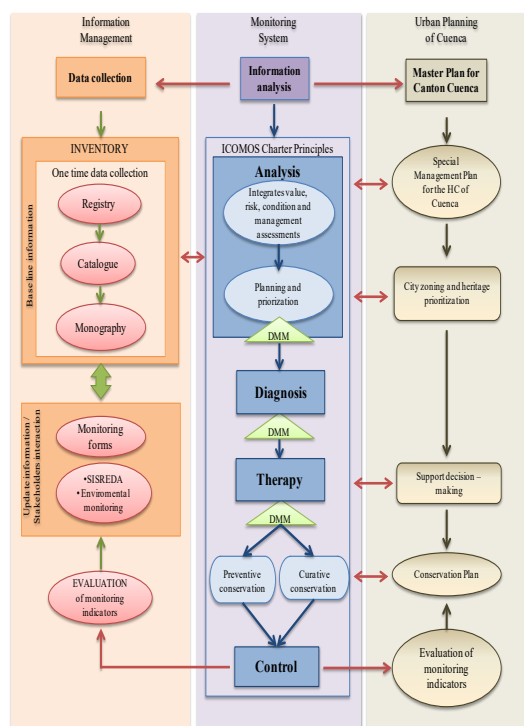


Figure 5. Heritage Management Scheme for the Historic Centre of Cuenca including at the core the ADTC methodology

TOOLS FOR INTERDISCIPLINARY COLLABORATION

The above shared *ADTC methodology* was taught in the Master in Conservation of Monuments and Sites. Its use by the students in the “Integrated Project Work (Integrated Project Work, s.d.) demonstrated that it created the conceptual framework to promote interdisciplinary collaboration. It leads to a proper diagnosis which is required to define in consensus the objectives of possible interventions. The methods and tools explained further, were created later in the same spirit.

From Masonry Damage Diagnostic System to Monument Damage Diagnostic System

Meanwhile also the collaboration with Monumentenwacht Vlaanderen (Monumentewacht Vlaanderen, s.d.) started from its establishment on in 1991. Monumentenwacht Vlaanderen was set-up in analogy with the example of Monumentenwacht Nederland (Monumentenwacht Nederland, s.d.) in The Netherlands that was established in each of the provinces since 1978. Monumentenwacht Vlaanderen and Monumentenwacht Nederland promote the preservation and maintenance of historically valuable heritage (both listed and unlisted) through regular structural inspections and independent maintenance advice. They help owners and managers to prevent damage and to extend the lifespan of historic buildings.

This collaboration led to various training activities and exchanges which revealed the challenge for technicians at Monumentenwacht -similar as for technicians in the field of built heritage in general- to make a consistent, verifiable and repeatable damage diagnosis which could also clearly evidence when changes over time occur.

“Expert system for the evaluation of deterioration of historic brick structures” (MDDS) was an Environment Research Project (STEP) that run from 1993 until 1995, co-ordinated by KU Leuven (Leuven, Belgium) in collaboration with T.N.O.-Bouw (Rijswijk, The Netherlands), Technische Universität Hamburg (Harburg, Germany) and Politecnico di Milano (Milano, Italy). It has contributed to partially resolve this challenge for brick masonry developing the Masonry Damage Diagnostic System (MDDS). It was an expert computer system designed to identify, analyse, and monitor damage in historical structures, particularly ancient brick masonry (and stone) monuments. It assisted in identifying deterioration types and causes to aid in conservation efforts, often utilizing digital mapping and web-based interfaces.

This Masonry Damage Diagnostic System (MDDS) has later on further be developed by TU Delft (Prof. R. Van Hees, dr. Silvia Naldini) within other EU-projects as the 1998-2000 “Environment Research and

Development” research programme of the European Commission (DGXII) “Pointing co-ordinated by TNO-Bouw (Delft, The Netherlands), in collaboration with Politecnico di Milano (Milano, Italy), Instituto Torroja (Madrid, Spain) and KU Leuven (Leuven, Belgium). TU Delft renamed it later “Monument Damage Diagnostic System (MDDS)”.

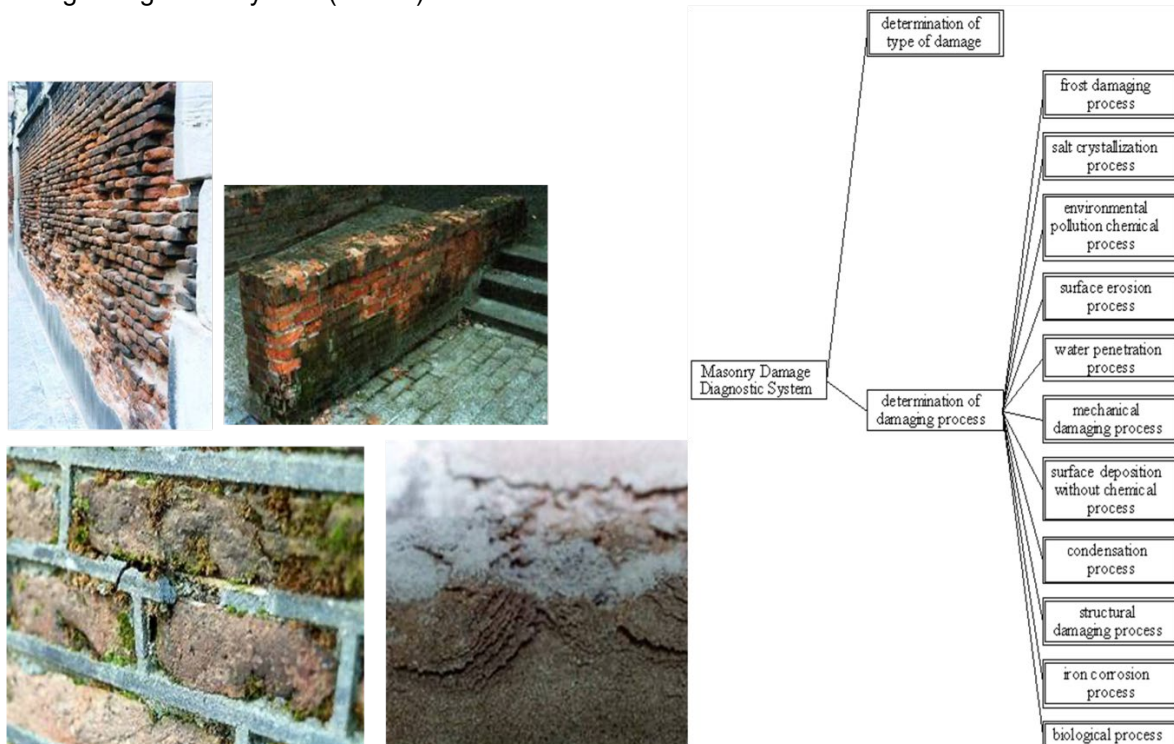


Figure 6. Reference images from the Damage atlas included in the MDDS (left). Decision tables used in the expert system to connect types of damage with damaging processes (right)

The approach used aimed at overcoming the hurdles of multi-disciplinary: guiding various types of actors starting with visual analysis to understand the need for further analysis and to come to a proper diagnosis and to possible remedial measures. It is very much anchored on the *ADTC methodology* while promoting simple ways for identification and diagnosis which can be used by various actors. The use of reference images, for example using a Damage Atlas (Franke et al., 1998), and the guidance the expert system provides in case of doubts in naming damage or identifying damage properly, are key elements to facilitate interdisciplinary collaboration. They also help to -referring to the iterative (loop) process- monitor at a later stage to review the state of preservation, for example during periodic reporting.

Since the end of the project the use of the MDDS was integrated in the courses and project works of the student of the master in Conservation of Monuments and Sites, linked to the RLICC, and this is still the case. Its use has demonstrated to be effective in facilitating interdisciplinary collaboration and to show students that input from various disciplines is required when dealing with preservation of built heritage and sites.

Surveying and documentation technologies

Surveys and documentation are crucial in the different phases of the *ADTC methodology*. The technology and tools to carry out documentation and (detailed) surveys of existing fabric have evolved a lot in the last decades. The available technologies influence considerably the possibility to carry out proper analysis and to integrate the input of different disciplines. Hand on measurements are increasingly complemented with laser scanning, photogrammetry or the use of LIDAR. These techniques also get more versatile when used with drones. The creation of complex 3D representations that can be used in collaborative settings also contribute to the enhancement of interdisciplinary input and collaboration. It creates opportunities and challenges. *A holistic and integrated approach for cultural heritage preservation taps into different kinds of resources, which requires acknowledgement of the complex nature of understanding and managing heritage values into an overall societal development goal (Vandesande, 2017). Documentation needs in the field of cultural heritage preservation are therefor challenged by the complexity of the sources of information, by the need to integrate them in a holistic tool and by the way they are able to dialogue with society. (Van Balen, 2017)*

Documentation and surveying tools are feeding the anamnesis and also the monitoring phases of the methodology. The more than 20 years experiences within the ARCH-DOC workshops as part of the “Built Heritage Documentation course” (Built Heritage Documentation course, s.d.) in the MCMS program making students acquainted with these new tools with the help of dedicated staff and including various ICOMOS CIPA members. The use of the outcomes of such documentation and survey practices in the interdisciplinary Integrated Project Work (IPW) has again demonstrated that such advancing surveying and documentation tools can be included in the *ADTC methodology* and help improving preservation.

The Nara Grid.

Looking back to the evolving concepts in the guiding documents in the field of Cultural Heritage (see supra) it becomes obvious how a material centred understanding of authenticity evolved to a wider multi-layered concept of heritage values. This is evidenced in the Bura charter (1979) and the Nara document on authenticity (1994) (see supra).

The “Nara grid” (Van Balen, 2008) developed in 2008 also became a tool firstly developed for students aiming at facilitating interdisciplinary collaboration and decision taking. Again, it can be integrated in the above-mentioned anamnesis and monitoring/control as we see happening again in the interdisciplinary integrated project works (IPW) carried out by the students of the MCMS.

Meanwhile various articles (from alumni and others) can be found that use the Nara Grid as an instrument to argue about heritage values but also to evaluate possible preservation scenarios or to monitor changes after interventions have occurred.

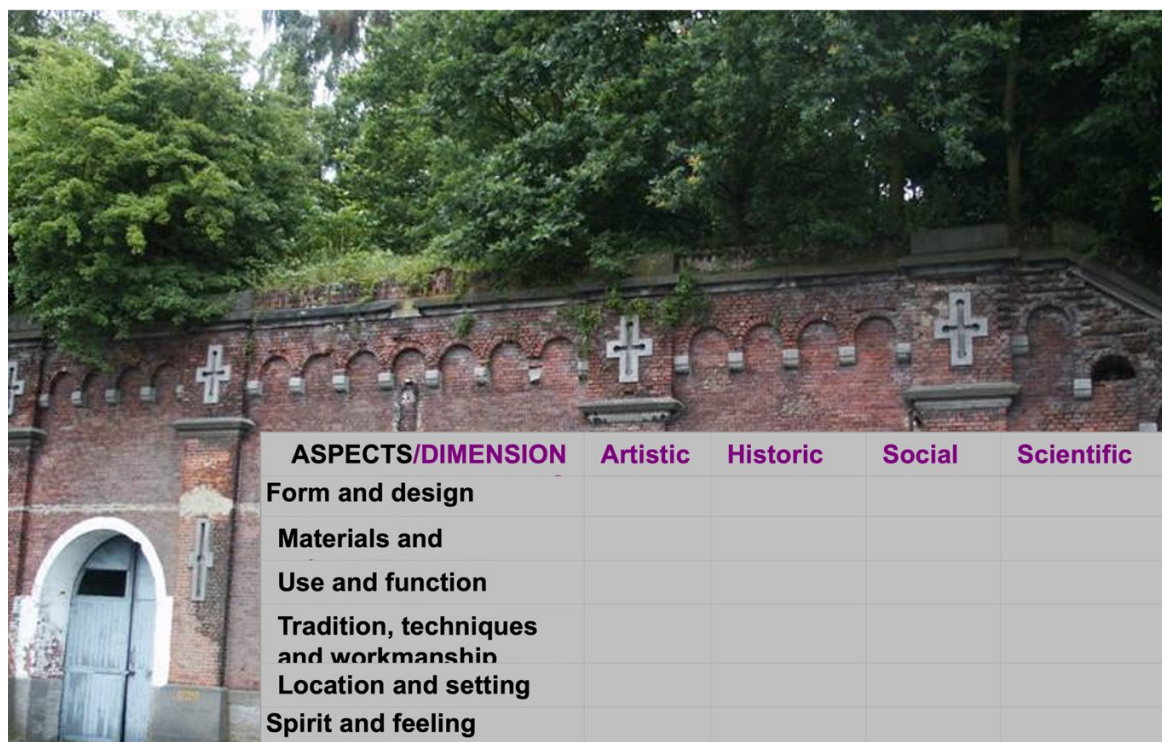


Figure 7. Defining heritage values of historic Masonry at Fort IV, Mortsel (B.) using the Nara Grid.

Risk Management at Heritage Sites

The collaboration of the PRECOM³OS UNESCO chair with the UNESCO office in Amman (Jordan) at the World Heritage Site of Petra has resulted in a very valuable and accessible publication (Paolini et al. 2012) that again brings together all previous considerations following the overall methodology but has added the dimension of risk management.

The latter is a core element in the preventive conservation approach developed by the PRECOM³OS UNESCO chair (Van Balen, 2015).

To this end a risk assessment methodology developed for movable heritage originally designed by R. Waller (Waller, 1995) has been adapted to one for built heritage. One of the major additions was to

include into the risk assessment, the risks that may affect the users of the historic building, considering that using a building (properly and in an adapted way) is one of the primary preventive conservation measures.

Again, integrating the explicit analysis of different “agents of deterioration” with understanding of probability and impact, helps interdisciplinary teams to discuss and negotiate a shared anamnesis that can help to set goals and objectives of intervention and can benefit (broader) heritage management.

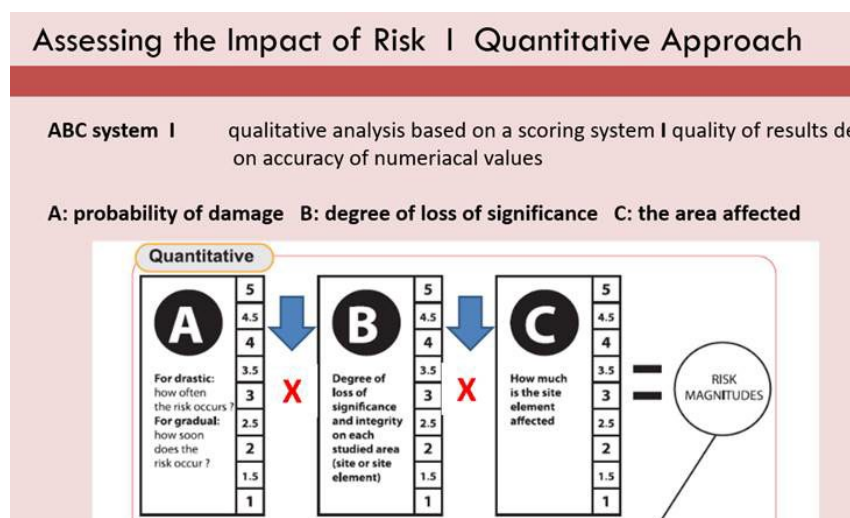


Figure 8. Risk analysis as part of a preventive conservation approach as shared in (Paolini et al. 2012, 31) (including a necessary correction: replacing “+” by “x” under the arrows)

CONCLUSION

The develop *ADTC methodology* developed in 1984 has demonstrated to be a tool that has been able to “absorb” the evolving approaches in dealing with the preservation of (built) heritage. Such evolving approaches in the cultural heritage field (as in many other fields!) have been pushed by changes in the regimes that govern the wider society.

The *ADTC methodology* initially developed for resolving stability problems aimed from the start to facilitate interdisciplinary collaboration in a primarily technical conservation topic. It has inspired various further developed tools with a similar objective as the Masonry Damage Diagnostic System (MDDS). The *ADTC methodology* has become part of the ISCARSAH Principles for the structural conservation of heritage sites in 2014 and it has become core of the preventive conservation strategies the PRECOM³OS UNESCO chair has further developed.

ACKNOWLEDGEMENTS

I like to thank all the people I had the chance to work with during my academic career; I could only refer to a few of them in this paper.

I also like to thank the organiser of the 4th International Symposium on Geotechnical Engineering for the Preservation of Monuments and Historic Sites for their kind invitation to deliver a keynote at the conference in Athens in September 2026.

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