One of the goals of the Maastricht Treaty is to promote the harmonic, balanced and sustainable development of economic activities, and not-inflating economic growth.

To achieve this purpose, the European Community has adopted a series of policies that, in addressing Culture, point out two main themes:
- cultural heritage as a tool to promote historic identities of lands;
- cultural heritage as a tool to promote a new economic development.

Following this direction, the PhD in "Design and Technologies for Cultural Heritage" is crafted to train new specialists equipped with an integrated skill set for the operation, management and valorization of cultural heritage.

Building on a wide background, the program reaches to interdisciplinary cultural areas and provides methodological and applicative tools developed in cooperation with institutions, private companies, governmental bodies and associations actively involved with cultural heritage, tailoring specific approaches and paying particular attention to the potential development of innovative skills.

The three year educational curriculum is based on:
- the history, critique and technologies for the restoration and preservation of historic heritage;
- strategies and methods for heritage dissemination;
- design and technologies for the fruition of cultural, environmental and landscape resources.

The distinctive competences of the program reside in the standards of excellence fostered by field experts, and the tight links with a privileged testing area: Mantova; the ‘città d’arte’; the minor towns; the Mincio river and its natural park; and the Po river basin - a propitious setting for the development of valorization scenarios driven by innovative technologies, design and communication.

The progressive and innovative results obtained so far have streamlined the scientific curriculum of the PhD program towards:
- the sustainability of interventions on cultural heritage, in relationship with the characteristics of heritage and its context;
- validation of design processes with regard to assets, tools, institutional and private operators;
- the economic importance of the interventions in relation with productive and cultural processes.

These directions allow a deeper integration of theoretical studies with practical experimentations. The program specifically explores the following issues:

1. **Analysis, safeguard, and preservation of the cultural heritage**: tackling instruments of analysis, classification and valorization of historic and artistic heritage at various scales; examining the concerns related to the degradation, maintenance, conservation, restoration and accessibility of heritage.

2. **Policies, strategies and instruments for cultural, territorial and landscape planning**: discussing the ethical approach to cultural heritage valorization; funding methods; and partnerships building for the management and operation of cultural heritage in the context of territorial planning.

3. **Design interventions aimed at cultural and natural heritage valorization**: examining the management of creative processes in contexts of high operative complexity; the social and environmental sustainability of interventions; and evaluation methods of the technical-economic feasibility of projects, for decision making and conflict management.

4. **Promotion and communication of valorization results**: investigating methods for management and promotion; “Good identity” principles; graphics and corporate image; communication; medium selection; landscape and urban marketing and sociology.

The technological departments have developed a wide range of methods to cope with such complexities. New project methodologies have evolved from linear processes to multi level interventions and revised work methods have evolved towards solutions that integrate a mix of cumulated expertise. Such knowledge resources can be innovatively applied to cultural heritage projects of different aims and scales: interventions on existing buildings, urban level projects, environmental projects, territorial infrastructure, or the cultural dimension of development. These themes represent important development directions in the activities of the doctoral program in “Design and Technologies for Cultural Heritage”.

---

**DOCTORAL PROGRAM BOARD**

| Chair: Fabrizio Schiaffonati (Chair) | Daniele Fanzini | Ingrid Paoletti |
| Roberto Bolici | Emilio Faroldi | Andrea Poltronieri |
| Adele Buratti | Matteo Gambaro | Valeria Pracchi |
| Federico Butera | Elisabetta Ginelli | Andrea Tartaglia |
| Stefano Capolongo | Carlo Monti | Massimo Venturi Ferriolo |
| Giorgio Casoni | Elena Mussinelli |
ADVISORY BOARD

Vittorio Algarotti (Piano Intercomunale Milanese)
Maria Barbara Bertini (Archivio di Stato di Milano)
Guido Cupolo (RAILS)
Philippe Daverio (Università di Palermo)
Dijon De Moraes (Universidade do Vale do Rio dos Sinos – Brasile)
Alessandro Maestro (Ottana Energia)
Gianmatteo Martinelli (Novelis Europe)
Pietro Mocchetto (Parco del Mincio)
Pierluigi Panza (Corriere della Sera)
Jan Rosvall (Chalmers University and Gotteborg University – Svezia)
Gianfranco Sassi (Graniti Fiandre)
Cesare Stevan (Politecnico di Milano)
Giovanni Valenti (Società Valore)
Guido Venturini (Confindustria Bergamo)
Guido Venturini (Confindustria Bergamo)

SCHOLARSHIP SPONSORS

Distretto Culturale Oltrepò Pavese
Distretto Culturale “Le Regge dei Gonzaga”
Fondazione Università di Mantova
The period of economic crisis contrasts with the consumption of culture and the interest of the National and foreign users in archaeologicalplannedareasthat are constantly high. Therefore, it should emerge the need to promote the cultural heritage, especially the archaeological one, above all in those contexts where it has a very important role for culture and identity.

As it has been recorded in literature, only 2/3 of the archaeological heritage are not surveyed, other have been damaged by agricultural works, infrastructures, clandestine digs and natural phenomena, causing the risk to collect also in the other sectors that revolve around the nucleus, by adopting solutions to appraise the whole territorial context.

The consequence is a methodological context made by consequential steps:

1. “process of the knowledge of the cultural and territorial capital”;
2. planning of the governance that comes before the government and presumes the European territorial policy; archeologico-triennale.html

For example: Parco Archeologico delle Incisioni Rupestri di Naquane; Archeological Area of Cape Boe; Via Claudia Augusta archaeological project; Archaeological Park of Bliesbruck - Reinheim; Suomenlinna (Finlandia). M. Mussinelli, A. Tartaglia A., Il patrimonio culturale nella planificazione strategica, in Progetto e tecnologie per la valorizzazione dei beni culturali, Quaderni del PTVC, Maggioli Editore, 2011, pg. 60.

If the public administration is able to act also in the other sectors that revolve around the nucleus, by adopting solutions to appraise the whole territorial capital.

The aims of the metaproject are two:
1. the development of a management plan for the territory with very important archaeological resources;
2. the application of the theoretical management plan in Marsala to protect, maintain and give value to the cultural resources, to the landscape, to the architectural elements of the territory with an integrated approach, starting from the archaeological area of Capo Boe. Overall, the research gives an important contribution to the economic and social development of a territory and of its heritage.

Moreover there is a lack of experts in the field of integrated management. Only recently the efficiency of the multidisciplinarity, the ability to share the knowledge and the importance of the contribution of the Technological sectors in the cultural field have been highlighted. Based on these considerations, the aim of the research is the creation of a metaproject applicable in those contexts where the archaeological heritage has a decisive role in the territorial system. These contexts are detectable if we consider some elements regarding the archaeological resources which, in a management point of view, are considered nucleus of the territorial system. These elements are typological, quantitative, social and identity, economic, attractive and systemic.
THE ETHICS OF PUBLIC SPACE
Theories, confrontations and models for the regeneration and appreciation of a social cultural good in the contemporary agora

Arianna Dalle Carbonare - Supervisor: Emilio Faroldi

During the past few years, our country has been the place of an attentive and aware disciplinary debate as regards the principal dynamics of transformation, deconstruction and fragmentation of the urban public space. The drive toward the decomposition of traditional settlement models and the continuous alterations of the main social structures appear to raise the interest of the public opinion toward the future of our spaces that, even though constantly changing, are a reflection of the deep conscience of a society.

The postulate of the thesis is based on a survey on the subject of urban public space, which has highlighted its limits, perspectives and potential. This analysis was carried out in the context of the current dynamics of transformation of the act of inhabiting and of a renewed culture of the appreciation of the public property.

The observation of the rarefaction of the relationships between individuals - more and more delegated to the proliferation of new virtual ambits – on the other hand balanced by the will of putting forward development strategies, expressed by the urbanistic branch of learning, with the aim of strengthening and upgrading the physical context of public spaces and of social interest.

The urgency of such upgrading is rooted in the results of the observation of the state of the art. The constant change of measuring systems, once the very basis of life rhythms, and the sudden and incessant variability of the customs of societies, makes it impossible to distinguish between the two founding polarities of our cities: the urbs and the civitas. This lack in uniformity is also accompanied by a lack of functional efficiency of the contemporary public space, unable to offer solutions that can be used to adapt to the ever changing social identity.

In these terms, upgrading is a priority tool for regenerating a place that represents, in many a case, a space of generic flows of commercial transit and exchanges, which makes it unexploitable for social purposes. The constant diffusion of space typologies, ever newer and different, determines a strong difficulty in detecting the boundary lines that interpose between the two. Identity loss, rarefaction of the physical contacts between individuals and increase of fragmentation phenomena, enhance the disarticulation of spaces that were originally thought for encouraging social relationships, resulting in the city losing its natural role of builder of identity bounds for its community.

The difficulty of detecting clear boundary lines can be linked to the observation of another phenomenon, which consists on a sort of ongoing competition between traditional public spaces – that can be associated, generally speaking, to those of the historical city – and the new typologies of public space, physical as well as metaphorical, that are thriving, in a very heterogeneous way, in current society: from the virtual space of social networks to the spaces for the consumers, those typologies are greatly increasing, which makes it very hard to actually classify them.

These new forms become very attractive, because they seem to offer a number of usage and performance levels that meet, or best satisfy, the rising needs of users. In this sense the historical city, even though still keeping a great attractiveness thanks to its very DNA, does not appear to be able to find an actual link with the new public space forms generated from contemporary society and, in this context, seems to be weaker.

The object of the research is addressed through a triple functional classification: the first part is aimed at analyzing the state-of-the-art of public urban space, the second one is meant to verify its consistencies through the punctual definition of subject and object and, ultimately and strictly linked to this part, the third section embraces the experimental setup of the study by explaining the constitutive elements of the work. The procedural phases that lead the research path wind along rooting from a theoretical-critical survey. The documentary record has led to the pursuit of a reconstruction of the notion frame, to which we have applied a revision filter – the methodological thread of an analysis aimed at inquiring, specifically, the modern reality, both literary and of project-making, in order to detect possible critical aspects and points of strength.

Starting from the very beginning of this work, the critical approach has emerged as a crucial element of it, showing the need of addressing a targeted glance toward the technological component that can be related to the space of the relationship. Its added value appears to reside into complex relationship dynamics, the ephemeral patrimony – which is not architectonic and visible – of the relationship linking the citizen to its social ambit, through a mutual exchange of complex symbolisms and meanings.

In these terms, the expected results work as theoretical reflections aimed on the one hand at highlighting the strategic role and capital offered by the relationship spaces, meant as a privileged occasion for urban upgrading, on the other hand at pointing out the potential offered by the latest evolution state of the space typologies for public life – virtual networks. Such reflections are believed to be the very linking point to the formal incompatibility that is generated between the historical public space and the space intended for transit, connections and trade. The new dynamics of social interaction reaffirm the wide success of these new interaction modes, of which this thesis wishes to show the instrumental role in recovering new urban functions of upgrading what already exists. The non-material world is here seen as a place for social sharing with an important potential to be inquired in depth. It is able to generate beneficial effects on the city of things, of a historical complex that is deeply rooted into the past and that nowadays, on the other hand, undergoes an actual loss of its identifying and symbolic power.

The research was also keen to prove the paramount role taken over by the interactive potential of the net, which, in its complex tangle of identities and functions, can play a significant part in the restitution of a renewed function of socialization and identification to the space of places. The new perspectives deriving from this thematic layout find their concrete application in the overemphasizing of the role of these places and in the firm belief that there are urban upgrading practices and actions for the regeneration of its fragments that can arise from a joint action able to put together the public space of places and virtual public space.

The dynamic characteristic of this latter can be directly beneficial for the forms of interaction springing in the city of physical space – be them a part of the consolidated reality of the negative, or related to the city of fragments. Sharing and researching possible coexistence forms between the two parties are the drives at the very basis of this research.

The theory that is here brought forward finds its actual basis on the thesis that the settlement of new forms of sharing between the physical public spaces of our cities – even though in their undeniable differences – can lead to an actual improvement of the quality of the urban public life. The link able to constitute a binding agent for the formal incompatibility of these spaces is the virtual public space constituting an occasion for a privileged context between the historical nature and the identity nature of the space of relationships and the fluid and dynamic vocation of contemporary fragments.

Tania Delgado - Supervisor: Raffaella Trochianesi

Methodology
This research has been developed from a framework that explores the Tangible and Intangible aspects of Historic Centres, finding how the Oral Patrimony has an intrinsic potential that connects these resources through Storytelling. Cases of Cultural Patrimony Safeguarding and Valorisation managed by different entities of the European Union Commission and cases of Oral Patrimony that have been always handled as separated areas, even though have all the potential for being exploited in an integrated way. This unexploited integration has been the main foundation of an innovative path that through some experimentation has structured this proposal. Furthermore from different approaches of Design (Emotional, Co-Design, Sustainable, Interactive and Digital) this research has been structured for making citizens not only users and consumers of their Cultural Patrimony, but also creators able to reincorporate their cultural resources in the construction of Creative Industries and therefore a Creative Economy. Through the vision of Emotional Design this proposal intends to enhance Historic Centres, for arising emotions that could make citizens to revalue, retake and reincorporate their intangible and tangible Cultural Patrimony in the contemporary reality. With the support of Co-Design the roles of the citizens as users-consumers of their Historic Centres, and as the main creators and re-creators of their Cultural Heritage can be encouraged. The Sustainable Design approach articulates this proposal with a reasonable use of the Cultural Patrimony within initiatives of sustainable development at different levels (cultural, environmental, social and economic). From the Interaction Design perspective (that proposes an approach between objects and users that transcends the functionality) the user experience has been enriched, for deepening the connections among citizens-users-consumers and their Historic Centres. And finally through the Digital Cultural Heritage the research work has been supported for improving processes of collection, digitization, preservation, etc.

Research framework
The UNESCO’s Historic Centres have an outstanding universal value evaluated by an international advisory board, which recognizes them as “masterpieces of human creative genius” and irreplaceable sources of the humanity. For this reason they must be protected with a contemporary view that preserves their essence without fossilizing them, which means a “safeguarding without freezing”. This concern recognizes the importance of many intangible practices, which have had an important role in the creation, preservation and transformation of these places, because “The intangible heritage must be seen as a broader framework within which tangible heritage takes on its shape and significance” (Bouchenaki, 2004). “The Cultural stimulation for the Old Town vitality of Lublin (Poland)”, “The Training School of the Historic City of Úbeda (Spain)”, “The Revival of Traditional Craft Activities in Vilnius (Lithuania)”, and the redevelopment of Quartiere Spagnoli and the Rione Sanità (Naples, Italy), are some of the initiatives (analyzed in this research) that give a prominent role to the Intangible Cultural Heritage in the regeneration of urban historic areas, enriching the traditional vision of conservation-valorisation. However the unstoppable entrance of tourists to these places has affected the social tissues of the inhabitants with their Historic Centres (Beech, 2012). The citizens of these UNESCO’s sites have been left aside for the demands of this industry, affecting the locals’ quality of life, causing the abandonment of these places, and therefore threatening one of their main functions: “to be a place for citizens to live, work and socialize” (Scheffler and Calvanes, 2010). From this analysis the research question was structured: Can these Historic Centres be kept as Living Places, based on the rebuilding of their urban tissues between their human and cultural resources (intangible-tangible)?

The Oral Patrimony potential
For confronting this challenge the Oral Patrimony offers the possibility of creating original narratives able to contextualize Historic Centres in our modernity. This integration of the Oral Patrimony with the Historic Centres gives citizens the possibility of perceiving these sites as scenarios of a wide range of stories that weave events (Cultural Practices) and protagonists (members of the local communities), for explaining the architectural landscape (Tangible Patrimony). Some examples will be described in the cases of Oral Patrimony: “Singapore Voices” the “Museo Audívisivo della Residenza” (Audiovisual Museum of the Resistance), Sensitive City and Sensitive Map, among others, which use the original voices of the protagonist for creating a deeper impact in the listeners. These cases show the intrinsic narrative character of the Oral Patrimony and the strength of the Storytellers’ voice, which together have all the potential for reinforcing the visual narrative commonly present in Historic Centres. In this way, innovative journeys of Storytelling can be made within these scenarios, for revealing meaningful aspects of these sites and for creating (through the voice of inhabitants-Storytellers) an emotional approach between Historic Centres and inhabitants, which strengthens the sense of place and belonging and therefore the cultural identity (Lynch, 1972). Additionally with the creation of a Storytelling Platform citizens and visitors can recognize in the stories a wide range of resources that can be either part of the traditional economic sectors or create new ones. Then the entrepreneurial spirit of the inhabitants can be encouraged for the construction of Creative Industries that could structure a Creative Economy, based on the reinforcement of the protection-valorisation of cultural goods.

Innovative aspects
These aspects are based on the unexploited potential of the Oral Patrimony in the regeneration of historic areas, which was used for creating a Storytelling Platform that: Gives a voice to Historic Centres, Integrates Emotional Design in processes of Safeguarding and Valorisation of Historic Centres, and Weaves through Oral Traditions a cultural-economic system able to keep alive Historic Centres as Living Cultural and Economic Places, where the most treasured experiences of a community have happened and can continue happening.

Implementation in Mantua city
Taking advantage of the strategic support that Mantua is getting from the PhD in Design and Technologies Exploitation for the Cultural Heritage (PolIMi); this UNESCO’s site has been the platform of a Pilot Project that uses the Oral Patrimony in the creation of a narrative for activating the connections between inhabitants and the Cultural Heritage of this European Centre. This project has been structured on three main axes that have been fundamental in the definition of different researches and projects developed in Mantua: Education, Culture and Economy, which additionally have been supported with The Participation/Collaboration of the local communities, The Integration of the Intangible and Tangible resources of Historic Centres and The Sustainable Development. The efforts are focused on the creation of a Storytelling Platform that interconnects different administrative, social, economic, research and cultural bodies of the city (organizations of Enopatrimonio and Handicrafts, festivals and cultural events, the Museums, different academic and research programs at the PolIMi, ongoing projects of cultural tourism, entrepreneurial institutions like Mantua Innocentre, etc.) with a single goal: a Sustainable Development which preserves and valorises the cultural resources of this Historic Centre, balancing their authenticity with the contemporary demands.
MOBILITY AND LANDSCAPE. THE MOBILITY INFRASTRUCTURE AS TOOL TO THE LANDSCAPE ENHANCEMENT

Giusi Leali - Supervisor: Roberto Bolici

This research goals are the gathering and the networking of specific guide lines to define a landscape enhancement process of local territories crossed by great mobility infrastructure. These principles were deduced by the detailed analysis of the contemporary and past European and American experience related to this topic. Moreover, to define the process phases it was necessary to abstract the main elements from the enhancement proposal project of the Cremona-Mantova highway, developed in the central part of this research. This project has been built through the meta-project tool borrowed from the design and architectural technology disciplines. Its own structure allows the splitting of a complex process in simpler elements. Through these elements it was possible to identify macro-phases, expected results and possible options such as tools, documents and subjects forming it. The enhancement process has been defined as voluntary tool that helps to create a stable relationship between proponent authority and local community. The formulated enhancement system influences the whole infrastructure design process: from the infrastructure preliminary design to the infrastructure managing in the working phase. In order to make this research feasible its integration in the current process of Environmental Impact Assessment has been supposed. The first chapter of the research analyzes the mobility infrastructure features and the relationships between landscape and infrastructures. The first point analyzes subjects such as terminology, legislation (from European principles to Italian legislation) and European and American infrastructure history while the second point is about the research of the kind of infrastructure to be analyzed thus giving the reason behind this choice. This research is about the wide mobility infrastructure system such as highways but also technical elements and artifacts such as overpasses, viaducts and bridges, junctions and traffic circles, tunnels and their services such as toll booths, service areas and stations, parking areas, noise barriers, embankments and mitigations.

The second and third chapters of the research deal with the state-of-the-art about the theory of infrastructures insertion in landscape from a local enhancement point of view. In this section it is analyzed the relationship between the conservation and the transformation in the "infrastructure-landscape" system and its strengths and weaknesses. The historical model, and the different cultural approaches on the subject, have been developed examining, in depth, the contribution of two of the main protagonists: Lynch and Lassus. To set the analysis and to increase the research sample group, the European programs, the Italian researches (PRIN) and some main contribution from technological platforms (PTE and PTIC), have been identified and analyzed. About the design experimentations, to arrange the research, a list of actions has been identified. This list has been necessary to define the research investigation field, otherwise too wide and not consistent, and to focus the attention on the great infrastructures giving added value to the landscape, following the principles identified as critical interpretation. The case studies identification and choice have been guided from the assumption that the infrastructures are an added value to the territory, and so they can represent a valid support to the enhancement process, both because of their intrinsic value, and because of the relationship they develop with the landscape and with the local community. In order to make general considerations, a representative sample of different international and national case studies has been identified, with the goal of building a proposal of a model useful to direct the territory enhancement process. A critical analysis has been made through a grid of drive forces not identified, gathered from the case history and cultural approaches, allowed to pass judgment on the best practice examined. From this analysis four essential elements have been discovered: the multidimensional reading of the local territory, the definition of new tools and the correction of the existing ones, process quality and sustainability, and finally the design addresses to the enhancement of the local territory. While the first three elements need structural actions on the system and on the legislation, the last one collects the cues from the analysis and organizes them in a model of local system enhancement. The research ends with the codification of these observations and design elements in a model composed by guide lines able to regulate local territory enhancement system. The fourth and fifth chapters get close to the architectural technology subject, the hypothesis that has been verified is if with process tools, the local system involved in a great infrastructure project, can find in it a driving force to the local territory enhancement of landscape, culture and tourism. To structure a territorial enhancement model, it has been necessary to experiment a design proposal. This operation allowed the verification of its feasibility and it permitted to abstract the model in order to use it in different territorial contexts. As a design proposal, the territory of Mantova has been chosen after a deep analysis of its heritage. In order to analyze its heritage, provincial and regional addresses and developed academic studies have been taken into account. After those actions the project of the Cremona-Mantova highway has been chosen as the experimental case to be considered. Evoluting the highway final design, the masterplan of the local system enhancement has been designed. From the strategic addresses taken from the masterplan, a pilot project has been designed. The comparison with the reality allowed to better calibrate the design proposals which in the model have been split in expected results and possible options and tools. So the model presents itself like a voluntary tool, and it is able to address the infrastructure territorial system design and to be an inspection tool useful to check the design choices. The main expected goal of this research is the building of a model, taken from the theoretical and practical contributions from the literature and from the Mantova-Cremona highway design proposal, able to suggest to different territorial realities, combined by the presence of a mobility infrastructure project, a way to proceed. The suggested way should help to involve and enhance the whole local system, starting from key elements like public and private subjects about economics, politics, technology, communities and intangible and intangible heritage. Through the relationship between these key elements and with the help of involvement and digital tools it is possible to build a network able to guarantee the good work of the whole system. A development project might be thought as the field test, capable of optimizing the model, depending on different infrastructure typologies sample, located in different territories and seen at different realization levels. The possibility to share and broaden the number of experiences appears to be an effective method to improve and update the whole system. Another example of development trajectory is the use of e-partecipation tools to take advantages from freedom of communication, typical of digital communities, both in the communication phase and in the enhancement process. Ideally, the final objective is to create a "cultural enterprise devoted to the local public benefit", investing public funds in cultural projects. This cultural enterprise should represent all local cultural systems, avoiding both resources fragmentation and the decrease of reinvestment power.
SYNERGIES BETWEEN MANAGEMENT AND VALORIZATION OF CULTURAL HERITAGE THROUGH MODELS BASED ON BIM TECHNOLOGIES

Matteo Lo Prete - Supervisor: Ingrin Paoletti

During the last decades the rise of digital technologies introduced a radical mutation into our contemporary society. The world of culture, even if deeply connected to the past and to traditions, cannot ignore this kind of revolution, and should take advantage from these new technologies by involving them into an own renovation process. In this sense and at European level, a series of international programs were launched in order to associate digitization strategies to the European cultural heritage, coordinating and focusing the efforts of many countries into a single impulse concentrated on common growth and evolution. Stimulated by this primary impulse, countries like France and Italy started to develop their own national strategies, aiming at implementing the digitization programs at different scales. The international effort focused on digitization strategies for the diffusion of the cultural heritage is also combined with the aim to preserve and maintain cultural resources, protecting them from an improper use or the degradation process due to their exposition and fruition by the visitors. The management of this heritage becomes another crucial aspect that can be associated to the adoption of digital technologies and interesting solutions can be transferred from other fields that already adopt ICT or other technologies in order to improve management processes. The main aim of the research consists into the analysis of the problems associated to the efficient management of the built heritage in association to the need of valorization that distinguish this kind of goods from common buildings. Considering the research framework, some of the most urgent problems concern the acquisition, in terms of typology and methodology, of building data useful to define a model and track the evolution of the building, responding at the same time the possibility of exploitation of these data for management and valorization purposes. The customization of acquisition methods in order to respond to specific cases, and the preservation/implementation of these data across a non-ordinary lifecycle represents a complementary critical aspect. The experimental applications presented are focused on the definition of possible synergies between management and valorization of the built heritage through the adoption of digital solutions which can be extrapolated from consolidated processes. The introduction of such technologies and the results achieved are directed to the definition of a workflow based on 3D technologies, dedicated to the production of digital models able to create synergies between management and valorization strategies, with possibilities of connection with programs based on digitization campaigns at national and international level. The methodological aspects related to the research theme are mainly focused on the transfer of 3D and BIM technologies from building industry, and the application of such platforms for the integration of technical and/or contractual documentation into tridimensional representations of the building belonging to local, national or international scales. Technology transfer represents the methodology adopted for the development of the research, because it represents a useful and fruitful approach for the acquisition of technologies already consolidated in specific fields, and the cross fertilization promoting innovation and development. The construction industry already faced the problem of management of buildings within their life cycle, together with the integration of multiple sources of information into a single reference able to offer 3D representation and data management. This consolidated background can be transformed and implemented in order to face the specificity of built heritage realities. The experimental applications approached during the research, and that lead to the definition of a consolidated workflow for future activities, are focused on three historical buildings located in Paris: the historical Parisian shopping mall called La Samaritaine, the science museum Cité des Sciences et de l’Industrie and another shopping mall placed in Louvre Museum. The historical shopping mall La Samaritaine in Paris has the same level of importance shared by other historical malls in the French capital, like Bon Marché, Galeries Lafayette and Printemps. The history of the mall is closely related to the founders, Ernest Cognacq and Louise Jajj, and the architects Frantz Jourdain and Henri Sauvage, that realized between 1905 and 1928 a series of buildings of high architectural quality, hosting all the commercial activities, of the period. The case study is focused on the renovation of these buildings and the role of digital technologies in the process. The second case study, focused on Cité des Sciences et de l’Industrie, concerns one of the biggest and most important science museums in Europe. The building is constructed around the vast steel trusses of an abattoir sales hall on which construction started in the 1960s and had halted in 1973. The transformation, commissioned on September 1980 and the museum was then opened on March 1986. In this case an existing digital acquisition of the building envelope and external structure was analyzed, evaluating the possibility of developing a 3D model useful for renovation and future exploitation purposes. The experience is useful to understand the relationship between the quality of a digital acquisition through laser scan technologies and the development of digital models. The historical and cultural importance of the site increases the interest for this experimental application.

The last selected case study is focused on the renovation of a boutique in the Carrousel du Louvre the shopping mall which connects the two pyramids of Louvre Museum. The area is included into the renovation project “Le Grand Louvre”, designed by leoh Ming Pei and opened to the public on October 1988. The entrance of the boutique is directly connected with the inverse pyramid area, while the commercial space is about 3000 square meters. Although the location of the area differs from the rest of the museum being concentrated on commercial, a commercial space, the historical importance of the project and the delicate relationship with the museum under an aesthetical and cultural point of view are remarkable. The experience distributed on the three study cases, the repetition and optimization of some specific passages and the evaluation of the lessons learned from different experiences allowed the development of a consolidated workflow, that identifies a procedural approach to the development of a 3D “alter-ego” of an existing building, involved in at different levels in the cultural heritage of a local, national or international community. The key passages that compose the workflow are focused on: acquisition of building data, organization of point clouds and integration of other sources of information able to describe the built heritage, definition of reference geometries for architectural components, development/
FORMER MILITARY AREAS, BETWEEN CULTURAL ENHANCEMENT AND STRATEGIC DEVELOPMENT

Silvia Mirandola - Supervisor: Roberto Bolici

During the past decades the needs and demands of the public authorities have been changing, and this alteration has caused a significant number of public buildings to be underexploited, if not plainly abandoned. Nonetheless, these assets can still constitute a resource that can be rediscovered as a strategic element to be played in the process of development of the territory. This research particularly focuses on the subject of abandoned military areas’ upgrading. During the past years, this issue has been the core of a lively debate on the possible solutions of the problem, but – also due to the complexity of the subject – satisfying results have not yet been achieved. The issue of upgrading public buildings has found a new momentum thanks to the introduction of State Property Federalism, through which the ownership of a significant number of buildings has been transferred from the State to the Local Authorities, with the aim of having them enhanced. Even though these public assets are mainly located in strategic areas of the cities or territories, through time they have become empty shells, and only seldom local authorities have had the opportunity of including them in their urban planning and territory upgrading programs – a situation that has led to a worsening of their isolation and decay compared to the surrounding context. The activity of enhancement public buildings must be intended as an opportunity to set up a dialogue as well as synergies with the surrounding territory. This can be achieved by inserting the good’s upgrading intervention with the actions that are already part of the agenda of the local authorities responsible for the territory planning and will have the effect of bringing forth advantages for the community in terms of services and cultural development. In this perspective, it is therefore crucial to take into consideration the upgrading of the public areas’ patrimony, and particularly the military one, not much as the objective to be pursued, but as the very means which can make it possible to start up processes of cultural enhancement of the territory and processes of upgrading of the buildings and urban areas.

The research is organized in four steps. The first step consists on a desk analysis aimed at recreating the frame of reference knowledge that includes the subject of abandoned military areas’ upgrading. In order to do this, we have outlined the subject of the process of abandonment of public areas through an analysis of the topics related to the new meaning attributed to the upgrading of public buildings. The research has then addressed the definition of the norms scheme ruling the leaving off of public areas, outlining the different time stages of this process. At the same time, given the presence of a number of historically and cultural relevant goods into the public buildings’ patrimony, a critical analysis focused on the process of abandonment of many historically and culturally relevant buildings has been performed. The research has then lingered on the study of the process of abandoned military areas’ upgrading, starting from the outline of the rationalizing process of these areas carried out by the Ministry of Defence, to the later widening investigation on the legislative events that have characterized the abandonment programs of the military buildings patrimony. Concluding this first section, aimed at reconstructing the knowledge context, we have pointed out a few highlights on the critical aspects of the process of upgrading the public buildings patrimony, with a particular focus on the legislative activity, on the buildings’ handling and on the appreciation of the public assets having cultural relevance that are included into the abandonment programs.

The second step of the research starts with an analysis aimed at determining the numbers of the abandonment phenomenon in terms of the quantity of left off areas, their economic value, where they are located and the type of areas. Based on the data obtained by this analysis and the results of the desk analysis, we have outlined the aspects that make the military buildings’ patrimony strategic for territory development through the detection of the main connotations of the abandoned military areas.

As a second stage, we have analyzed the issues related to and crossing with the research, among which the potential that could arise from the upgrading of former military areas in terms of urban upgrading and as a tool for the sustainable development of the city and territory; the potential linked to the upgrading of military areas as a launching pad for the economic development of the territory through the starting off of new commercial and social businesses according to the social and economic connotation of the surrounding context.

In conclusion of this phase, we have inquired deeper into that portion of the abandoned military areas’ patrimony which is characterized by the presence of public properties having a cultural value. The analysis of the characteristics of the former military areas leads to identifying a number of critical aspects as well as opportunities that distinguish the process of enhancement of this specific patrimony.

In the next step, the study cases are analysed. They have been ideally divided up into two groups:

1. cases characterized by an actual feasibility on the territory. For these, we have particularly analyzed the result that has been obtained through the conversion;
2. the second group of study cases is an analysis of examples of enhancement processes of former military areas that have recently taken off. On these examples, the aspect that has been mainly investigated has been the governance characterizing the upgrading processes.

The analysis of the study cases has allowed to define a number of elements for reflection as well as a series of critical aspects related to the upgrading of the abandoned military areas’ patrimony that are ascribable to different but nonetheless intertwined ambit: valorisation, sustainability, governance, cultural heritage and strategic planning. The elements for reflection emerging from the analysis of the study cases underline how the subject of valorisation the military areas’ patrimony is a strategic issue for the territory’s development under a number of aspects: economic, social, political, cultural and related to the city planning.

Through the fourth step of the research, we have defined the “metaprocedure” for the cultural enhancement of the unused military areas. The “metaprocedure” is to be interpreted as a supporting tool for the project choices of the public subject that, through a strategic vision, intends to carry out a process of integrated cultural upgrading on its territory, based on upgrading interventions on the former military areas.

Starting from the background analysis and that of the study cases, the research activity has also detected the macrophases of the enhancement process of the abandoned military patrimony; every detected phase is broke down into the different actions for the development of an valorisation process, from a cultural point of view, of the abandoned military areas’ patrimony. The “metaprocedure” is a structural grid in which the public subject can devise projects aimed at enhancement former military areas in the viewpoint of highlighting the value of cultural heritage and of the territory, by integrating the upgrading process of the former military assets with the ongoing projects, or the ones that can be developed on that territory.
FROM CULTURAL HERITAGE TO KNOWLEDGE: “INTANGIBLE” AS A PROJECT MATTER

Neva Pedrazzini - Supervisor: Elena Mussinelli

This research aims to introduce and further discuss some theoretical approaches, developed in an ongoing research, about conditions and strategies that could be designed in order to better ensure Intangible Cultural Heritage reproduction and transmission and, at the same time, support its sustainable evolution. This research in fact, focused on the emerging social practices and traditional knowledge as a kind of distributed heritage (represented or manifested in distinctive or productive qualities and show modalities in which thanks to this processual nature, its socialization, communication and transmission, can be designed in order to lead to new interpretations and re-productions by living communities, users, designers, craftsmen. Cases histories have been selected and divided in: 1) Actions able to explain, transmit, restart and express the potential of transformation/innovation; 2) Actions able to share and communicate cultural heritage as an “open-ended knowledge repertory”; 3) Actions able to indicate possible sustainable development solutions, by the creation of eco-museums, knowledge sharing. According to the first findings of the research, the case studies analysis led to design an evaluation model for this kind of action and at the same time focus some critical conditions, factors and moments in which ICH and social practices can benefit and develop this transformation, in order to evolve in continuity with their tradition, preserving the recognisability, and re-negotiated, modified thanks to its inherit qualities and shapes. Cases have been mapped considering the spatial dimension (local, national, international), their knowledge type (productive or performative) and the activation areas indicated before (1, 2, 3). The areas of knowledge activation can occur in three processes: reproduction (self-representation), sharing (through new teaching methods; performances and events open to the public, co-development or relations with suppliers or manufacturers, application), communication (promotion through artfacts, languages and systems and communication devices that do not require a direct contact with the teacher). In these areas knowledge, as ICH, is innovated or from or by induction (cultural, economic, educational identification, market demand, institutions and public request). A single case could be characterized by the activation in different areas and the stress of several types of knowledge. The map shows which are the projects involving more development process: when more areas are involved in the process, the greater the strength of the action. The hypotheses were verified through three field projects: 1) UrbanMashUp in Kotachiwadi and Chor Bazaar in Mumbai, in collaboration with the Urbz Association, a project focused on intangible knowledge in action, able to offer new interpretations and re-production of heritage to communities and institutions, by documenting and communicating an historic neighbourhood at high risk of demolition and the popular muslim market in Girgaon. It verified how an user-centred design can be applied to ICH in conflict management and respect for cultural diversity, to develop virtues design management and decision processes; 2) “Contemporary Authentic Milan”, a research developed by DeCH (Design for Cultural Heritage-INDACO) focused on the traditional productive heritage of Milan, the so-called “Made in Italy”. The research project explored innovative systems and relational models of sharing, processing and reproduction of knowledge and skills of famous “Milaneese” craftsmen in new forms and processes, focusing on the dynamics of activation of “authentic”, their dissemination in local communities. It contributed to create scenarios of future development in two directions: in the system of use and production system; 3) “Documentation of exhibition processes”, a project work under the PRIN - “The design of the cultural heritage of history and memory knowledge”, it’s about the ways of archiving, promoting and enhancing the ephemeral nature of temporary exhibitions, focused on a specific element: the “exhibition design knowledge” as an emblematic form of contemporary intangible heritage. This expression indicates a complex set of knowledge and skills performed during the exhibition design process, from concept to realisation. Different configurations of knowledge and relational dynamics among the actors involved in the exhibition design process (from project to installation) play an important role in shaping exhibitions arrangements. This specific integration of design and craft knowledge and skills represents, in itself, a form of intangible heritage that mixes traditional cultural elements with innovative practices, and is worth conceiving as a culturally valuable intangible layer of exhibitions. Field research have further contributed to define some moments (among the phases of recognition, appropriation or institutionalisation), factors (delocalisation, hybrization, new technologies and qualities (forms, processes and representation of the heritage) that can activate the potential of transformation, outlined as a possible model for a sustainable activation of social practices and traditional knowledge. Furthermore the lack of attention on intangible cultural heritage should be considered a limit for the enhancement and valorisations of the material one and so it is necessary to reconstruct this distinction for effective planning in a context of sustainability (economic, social and environmental). This research would outline this heritage as a resource and an opportunity not only for the socio-anthropological theories, but a fruitful field of exploration, where project culture able to identify strategies and tools, adding value added in the processes of generation, enhancement and use practices, in terms of sustainability, restoring the broken connections from the classificatory distinction of material and immaterial heritage.
The thesis, that investigates the importance of the historic hospital assets and the need for its valorization, aims to provide an operational subsidy for the rationalization and enhancement of the historic hospital network of Lombardy. This tool is addressed to administration, local authorities, architects, health companies, in order to operate quickly and more efficiently on the reorganization of the historic hospital assets of Lombardy, and, by means of simple but binding criteria, to do the most appropriate choice regarding the conservation or disposal of an historic hospital.

The research is part of the disciplinary field relating to the valorization of cultural heritage. More precisely, the object of this study is directed towards the historic buildings, with current health function and state property. Moreover in order to answer with greater coherence to the context of cultural heritage, it is also done an historic delimitation, which refers to Legislative Decree n. 42/2004 (Code of Cultural Heritage and Landscape) as subsequently amended by Decree Law n. 72/2011, according to which the research analyzes the buildings over the age of seventy years and therefore directly hedged-in. In parallel with the field of cultural heritage, the scientific areas related to my research are the design of hospital buildings and the history of hospital architecture. In particular, the scenario in which the research starts is defined by the various economic, social, cultural, medical transformations, which in recent years has characterized the health sector. In fact, scientific progress; technological innovation; sophistication of diagnostic tools; the progressively aging population, which requires a greater need of care and assistance; the increase in degenerative and chronic diseases; as well as a wellness increasingly widespread, that leads to the demand of better and high-level services; involve a radical rethinking of medicine and assistance needs and radically change the characters of the hospital.

All these changes have a great impact on the management of the existing hospital assets, as they require a continuous updating of typological models and a continuous transformation of the facilities. On the contrary, as the data on the age and condition of the Italian hospitals show, the assets at our disposal, if, on the one hand, is characterized by a large number of historic buildings, on the other hand, is often unsuitable for its age to supply the modern health assistance, no longer being able to keep pace with the changes ongoing.

This great critical situation that characterize the health assistance system has led Italy to implement a long process of rationalization and improvement of the entire system. Therefore, strictly interrelated with the new organization of health facilities it becomes very important the valorization of historic hospitals. As the scientific debate shows us, we wonder, from time to time, what is the best process of valorization: when to keep and when to dispose the hospital functions. The advantages and disadvantages are numerous in both decisions, depending on the perspective from which each one looks, and this research attempts to give an objective interpretation, considering both the health demands and the demands of building conceived as a cultural asset.

Starting from these premises, the instrument stems from the analysis of the national legislative framework concerning the cultural heritage sector and the health sector; from the study of the characteristics of national and Lombard hospital assets; and from the need to consider a delimited field but with features that make possible to provide a tool that can be usefully adopted in different contexts. In fact, the choice of working on the historic hospital assets of Lombardy is determined by several reasons. First of all, because it is characterized by the basic and vital properties of sampling: homogeneity, abundance of constitutive elements, enough availability of the most current information. Furthermore, in the context of the national territory, the Lombardy Region shows a great vivacity into the process of reorganization of the hospital network and it has the largest hospital assets, with an average age and state of conservation that reflect the national average data and a number of health facilities with historic and artistic value among the highest.

The Region has conducted between 1996 and 2002, a process of mapping of the facilities owned by the regional health, pointing out to losses, against the general lack of information, to have quantitative data of reference. Taking advantage of these data, in fact, the research provides a precise overview on the extent, the age and state of health Lombard assets. Consequently, starting from the scenario of 2002, the thesis analyzes which interventions have been implemented over the last decade, pointing out to losses which are the facilities that are not already longer in use, which facilities have been built ex-novo and which facilities remain. This allows to know which properties have already been used for other function and, on the other hand, which facilities must be still enhanced and destined to other function. Instead, in regard to the historic facilities still in use by the health sector. Through the proposed instrument, the thesis provides a method to evaluate which facilities maintain with health function health and which of them divest. At the operational level, for the definition of the instrument, I have analyzed some case-studies representing the most significant and important requalification projects of hospital buildings in Lombardy, whose comparison has allowed to determine the specific criteria for the rationalization of the cultural heritage.

Specifically, the tool is implemented through the proposal of a new and efficient model which considers the more current principles of hierarchy of levels of assistance and of reorganization of the global network throughout the territory, which were accepted by the Lombardy Region. The model divides rationalization in Vast Areas and, for each of these, defines the way of structuring the hospital network, organizing the hospitals on the basis of three hierarchical levels in relation to their function. Within this model, that guides the new organization of the entire hospital network of Lombardy, the tool provides the procedures for the rationalization of historic hospitals. This rationalization is achieved through the check of the facilities that can still support health functions without forcing and, instead, the check of those that must be divested. Implementing a necessary process of disinvestment of the hospital network, it is provided a grassroots evaluation to ensure that for every hospital divested they are rebuilt ex-novo only those that really necessary, overtaking the repetitiveness of functions present in the territory and keeping only a few essential nodes. In this way it is possible to rationalize the historic heritage and at the same time make a fair and uniform distribution of all the facilities in the territory, according to their specific function. This process of rationalization permits an adequate valorization and protection of the historic buildings. In fact, it allows to protect the historic building from the obnoxious conservation of hospital functions, if they aren’t more appropriate to its “vocation”, and in any case to achieve a better fruition of the cultural building, responding to the needs of the community. Through the action of disinvestment, moreover, it is possible to recover a large part of the historic hospital heritage, effecting on it the necessary process of valorization. It is verified the validity of the instrument, employing it on an historic hospital of the Lombard heritage. Validation that confirmed the effectiveness of the methods of response provided by the tool.

It is important highlight, in any case, that the effective and concrete protection of the historic building, especially in the case of an action of disinvestment, must be implemented through the consultation with all actors that are part of the process and are present in the territory (local authorities, health companies, citizens).
The territory and its local community establish a vital, utilitarian, identity and sentimental relationship that in normal condition is characterized by a homo-kinetic balance, i.e. constantly reconstituted further to the continuous variation of its terms; with reference to this relationship, the natural catastrophe configures as an exceptional moment of breach that involves not only the physical structures but the whole socio-territorial system as well, as it generates sudden alterations of the juridical, ecological, geographical, social, economic, environmental, historic, artistic and urban-architectural profiles.

Among all catastrophic events, the present research focuses on earthquakes and it in particular deals with the subject of the reconstruction after the event. Each earthquake has its own history; its post-event scenarios are very specific to each case for they are co-determined by several factors such as the historical-political and socio-economic moment, the seriousness of the damages, the territory morphology, the construction typologies, the orientation of the territorial development, along with other profound factors such as local culture, traditions and even the character of the population.

The present research specifically chooses to cope with the reconstruction of the territory of L’Aquila hit by the strong earthquake of April. The first intent is to comprehend the quid of the reconstruction, intended here not so much as a product but rather as a process, i.e. its why, what, who, how, when and where; to imagine a desirable scenario; to trace a path that may lead to the re-activation of the socio-territorial system throughout the integration of all factors and needs in the direction of local development.

The unique and irreplaceable resource that may constitute the leverage of the reactivation of the city is undoubtedly its historic centre, for it lays foundations for a development that may be local in terms of resources, global in terms of relations and auto-sustainable in terms of modality. It indeed represents a unicum of special multiscalar and multidisciplinary value, that, besides representing one of the most relevant artistic heritage in Italy, has also always constituted the pulsing heart of the daily and night life of the entire city but it unfortunately resulted the most severely damaged area in the reconstruction of which still struggles to get started.

Hence, what reconstruction for the historic centre of L’Aquila? In the effort to pursue the active enhancement of the historic centre, the integration between pre-existence and contemporary uses and eventual application of modern technologies is essential; we therefore find ourselves facing relevant questions, both theoretical and practical, the answer to which is neither unique nor universal, but it must be searched at local level by means of all stakeholders involvement and integration. The reconstruction process of L’Aquila has denounced the quite complete lack of the whole of the territorial stakeholders engagement, even though best practices from past post-earthquake reconstructions, such as those of Friuli (1976) and Umbria-Marche (1997), have clearly shown that the key of a successful reconstruction lays on the construction of widely shared and concerted plans and strategies. Given the complexity of the post-earthquake scenario, the reconstruction process should therefore aim at integrating the top-down and bottom-up approaches so that all stakeholders, i.e. administrators, public bodies and agencies, professionals, agents, social forces and citizens, are given the effective opportunity to constructively interfere with the process while respecting precise surrounding conditions and referring to the specific public agenda.

Taking into consideration the medium-big demographic and territorial size of the city therefore the difficulty in efficiently applying the traditional methods of direct comparisons, and also in light of the lack of involvement particularly significant with reference to the youth, it appears necessary to introduce profiles of innovation within the participatory processes. The first innovation concerns the cultural approach: the institutional authorities must understand the opportunities and potentials offered by the construction of shared decisions for the territory and adapt their structures and processes consequently. This commitment must be communicated widely, demonstrated in practice and validated regularly.

The second innovation concerns the use of advanced technology and it is aimed at extending the practice of democracy to all legitimate subjects. The implementation of the eGovernment techniques, that is the introduction of digital technologies within the participatory process as integrative, not substitutive, support, seems to be the appropriate strategy that may consent to reach the proposed objectives by strengthening and improving the traditional participatory ongoing processes and procedures, as well as promoting further and innovative ways of participation throughout broadcasting channels and eventually public administration assumes an extremely relevant role especially in the contemporary age for transformations happen very rapidly, against societies that historically have been accustomed to a virtuous practice that, by means of innovative practices, may lead to meet the targeted reaction. This is a real chance to finally transform the catastrophe into a “growth opportunity” in terms of local development and of implementation of new models for territorial governance that both respond to the territory needs and to the contemporary society’s expectations.