Designing Resilience

edited by
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Cover
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Piet Mondrian, *The Gray Tree*, 1911

Book series STUDI E PROGETTI

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This e-book has been subjected to blind peer review process.

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ISBN 9788891635983

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Maggioli Editore is a trademark of Maggioli S.p.A.
Company with certified quality system Iso 9001:2000
47822 Santarcangelo di Romagna (RN) • Via del Carpino, 8
e-mail: clienti.editore@maggioli.it

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Released in the month of June 2019
by Maggioli Spa - Santarcangelo di Romagna (RN).

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1.1 ADAPTATION VS FRAGILITY, RULE VS EXCEPTION: ANTINOMIES OF THE ARCHITECTURAL HERITAGE

Maria Luisa Germanà[*], *Vincenzo Paolo Bagnato*[**]

The positive meaning of the concept of resilience has actually been intensified, moving from the materials science (where it indicates the property of a material to absorb impacts without breaking), to psychology (where it indicates the capacity of individuals to face and get over traumas and difficulties). In the evolutionary vision, the ability of an organism to adapt to environmental mutations is a condition for survival. Similarly, in the technological field, the capacity of changing state, i.e. flexibility, is a system's feature that permits its adaptive transformations, by increasing at the same time its performance standards.

The positive meaning is also recognized when applied to natural or built environment, where it indicates the property to respond to external conditions without losing its own nature and, furthermore, taking the opportunity of positive evolutions. In the subsequent extensions of the original meaning there is an unspoken distinction between a "before" and an "after", in the sense that the changes of state take place precisely due to resilience.

This property maintains its own positive meanings also referring to the specific architectural heritage operational field, and could be (at the same time and in parallel) considered both a connotation of the built heritage and an objective for the entire conservation process, in which the project plays a central role.

The intrinsic resilience of the architectural heritage

The built environment in which every generation recognizes the meanings of "heritage" (that implicitly impose the conservation and the transmission to the future) has an intrinsic adaptability, recognizable both in material and immaterial aspects. In fact, the architectural heritage is often a palimpsest, in which a large number of subsequent adaptations to many different natural and human factors (intentional or not) can be recognized; in the Mediterranean area, where the permanent human presence in the same places has produced sedimentations

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and stratifications, this is particularly evident.

Uninterrupted modification processes show impacting effects on the architectural heritage much more than those of other forms of cultural heritage, due to, for example, the essential exposition to the environmental conditions and the important question of the "use" (Germanà, 2015). This keeps happening, also long after the rising of the conservation objective, developed as a consequences of the interruption in the technical and operational continuity of the pre-industrial tradition. The adaptability, as an intrinsic quality of the architectural heritage, can therefore be recognized referring to the historical transformations already occurred and mostly still readable in the building palimpsests, in their capacity to maintain their own identity despite the transformation processes that have occurred.

A vision focused only on a conservative instance, such as that dominating Italy in the twentieth century, has led to draw attention on the fragility of architectural heritage, overlooking its potential of adaptation and emphasizing aspects of vulnerability. A decisive change of methodological paradigm is due to the technological approach to the "design of the existing", that in the last decades has finally introduced a balance between conservation and transformation as a main design goal (Di Battista, 2006).

Indeed, there is a wide range of interventions that demonstrate a contemporary reinterpretation of the specific identity of architectural heritage. However, at the root of these experiences, a personal sensibility and a predisposition toward the act of listening of the single designer can be mostly identified, much more than to the outcome of a replicable design process based on shared procedures (as those indicated by the Italian Standard UNI 11150-1/2005 *Edilizia. Qualificazione e controllo del progetto edilizio per gli interventi sul costruito*). This situation may reflect a knowledge gap, whose solution can be found in linking the "intrinsic risk" with the "intrinsic resilience". Starting from this, the role of the technological design is becoming more and more important for the definition of a new cultural approach to face the dualism fragility/adaptation of the built heritage.

The contribution of the architectural heritage to the urban resilience

Many regeneration initiatives have focused on the built heritage in the last decades, extending the concept of landscape through a deep epistemological renovation. The new holistic vision of the urban issues reflects the overcoming of the dichotomies abandonment/rehabilitation, obsolescence/actuality, decrease/development, and it lands to an approach aiming a constant and permanent economical, social, environmental and cultural stability. Also the opposition between ancient and contemporary city, that has dominated almost entirely the architectural culture in the greater part of 20th century, is now leaving space to a

unitary view of the urban settlements, in which the historical parts are integral components of the contemporaneity, albeit in need of specific attentions (Germanà, 2013)

The dimension of medium and large scale has given a contribution to the current tendencies to combine the material aspects of resilience with the socio-cultural and economic ones: this new relationship becomes the main aspect of the technological design experiences on the architectural heritage. Linking together architectural heritage and modernity, Fusco Girard wrote that *«a resilient city combines its historical identity with shift, with old and new values, rationality and emotions, conservation and development»* (Fusco Girard, 2010). This can include Venice, which was recognized in 2011 by the United Nations as a *«model city in protecting the cultural heritage»*. The city has made resilience the main strategy for the protection of its cultural goods, history, and identity, as well as the social and economical strengthening of its community. It also codified new innovative defence tools for the ever-increasing natural and human factors of environmental risk, based on the recognition of heritage intended as social "resource" rather than a touristic one[1].

Even the projects called *Roma Resiliente* and *Milano Resiliente*, started between 2014 and 2015, when Rome and Milan were the only Italian cases between the actual 67 cities in the world (17 in Europe) nominated to become part of the program *100 Resilient Cities*[2]. Between these, by analogy with the Italian experiences, the Greek city Thessaloniki is particularly interesting: there the rehabilitation of the historical markets (notably the *Kapani Agora*) was considered a resilient strategy of urban regeneration, based on the strengthening of its historical and socio-cultural heritage.

The briefly mentioned examples demonstrate the need for integrating the vision of the cultural heritage as a main identity factor for sustainable development in planning (Carta, 1999) with a multi-scale approach to the architectural heritage, articulated enough to include its material aspects (expression of technical, technological and constructive knowledge accumulated and handed down from generation to generation), and its immaterial aspects (interested by seman-

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[1] See the Making Cities Resilient campaign of UNISDR (United Nations International Strategy for Disaster Reduction) and the Proceedings of the 4th ONU Conference for Disaster Reduction Strategy (2013 Global Platform) that took place in Geneva in 2013.

[2] The program provides for the opening of a strategic interaction between public and private and practices of civic participation and citizen involvement, both aimed at innovating urban management policies, regenerating degraded areas and improving conservation and accessibility for historical and architectural heritage. Launched by the Rockefeller Foundation, the program makes reference to a roadmap designed along four main directions, that specifically concern: financial and logistic support required to create a new figure in urban government called Chief Resilience Officer; consultancy for the development of a solid strategy of resilience; access to solutions, services and data bases for the operators in the public, private and NGO sector; inclusion in a global city network of cities that could dialogue, confront and collaborate between them.

tic factors, determined by changing chrono-topical conditions).

Consequently, it can be said that heritage's resilience is also "interpretative" and "relational", which means that it is based on a double subjective and social mental condition, common ground of the three worlds identified by Karl Popper: physical entities, subjective experiences and products of human thoughts (Popper, 2012).

The role of architectural heritage in the resilient design

Thanks to the adaptation potential of the architectural heritage, readable also in a contemporary sense, it is possible to define a new key driver for the urban settlements regeneration, succeeding in having a positive impact on economical and social aspects.

Firstly, it is necessary to define new system of shared values (a common ground), through which the historical and cultural identity can be protected and valorised in a multidisciplinary way. When the project deals, even indirectly, with the architectural heritage, this last represents a fundamental reference to the "resilient design". In fact, the appropriate consideration of its significance, at an individual and at a collective level, helps to substantiate social awareness and cultural responsibility, with specific reference to the dimensions indicated as priorities, starting from the knowledge of the *status quo*.

Secondly, it is possible to establish an active role for the heritage, whose function in the modern sensibility is very different from the simple contemplation, when linking the concept of resilience to creativity. Referring to the concept of "creative city" (seen as the place of actions by several social groups, based on development, innovation and collective cultural growth) and "civic creativity" (imaginative capacity to solve the problems of the city, aiming to collective good) (Landry, 2009) the architectural heritage could be considered as a product of the human activity which has assumed a special value out of the ordinary. A part of this value can be considered as a paradigm of the objective of sustainability and of the flexibility, as an attitude towards the continuous physical and social changes in the contemporary city.

Thirdly, the resilience of architectural heritage fixes its central point between the concepts of adaptability and transformability. Its own "permanence" demonstrates its capacity to adapt to new configurations, but its reaction to environmental or human events with more impact cannot take form in condition of degradation, abandonment or damage. On the contrary, this reacting feature depends on a clear move towards preservation and systematic, constant and shared maintenance of the monuments through a consciousness on a common cultural identity.

Finally, the transformability (the capacity to assume a diverse configuration from the original one) is only apparently incompatible with the conservation

objectives, for which new relationships between the heritage and the urban contexts and landscape and with the social dimension are especially essential. The transformability makes it possible to link the architectural heritage with the current human activities, creating new condition of equilibrium between tradition and innovation, ancient and modern and between conservation and cultural growth.

Resilient interventions on the architectural heritage

Mostly, the interventions on the architectural heritage do not always have succeeded coherently with its traditional intrinsic capacity of adaptation; as in the most common building interventions, the result is often a rigid built environment, unable to adapt to the most diverse subsequent transformations, and thus, basically fragile. Such a rigidity in the results, attributable to the antinomy "adaptation vs fragility", passing from the logic of products to the logic of process and design, can be traced to another antinomy: "rule vs exception".

On the one hand, the undeniable singularity of each example continues to justify the logic of the "case by case", tending to provide the *alibi* to give up objectively defined reliability (also reflecting a precise legislative and normative apparatus); on the other, also in this peculiar field of application, the objective of quality moves towards a resilient design, able to adapt to the uniqueness of the heritage, in terms of actual and potential meanings, without giving up verifiable and upgradeable methodologies.

Hence, the resilience is, at the same time, an objective and a requirement in the framework of the interventions on the architectural heritage that aims to be sensible to its multiple meanings, leveraging a technological approach (whose theoretical fundamentals are the systemic vision, the procedural dimension and the quality orientation). Consequently, the design that confronts the architectural heritage can acquire new methodological tools, characterized by some fundamental key points: the evaluation of the resilience level (respect to: different kinds of risk, reduction of resources, socio-cultural changes, new lifecycles); the identification of strategies likely to strengthen the resilient feature of the places marked by the presence of historical and architectural evidences (ancient and recent); the knowledge of the past experiences, between which finding best practices analyzable in terms of processes, in order to develop future scenarios and alternative models.

The resilience of interventions should be also traced back to some emerging topics (i.e. energy efficiency, social inclusion and participation) that lead to consider the architectural heritage by accentuating the already mentioned exigencies of adaptability and transformability. A great effort has been made to give a technical answer to these exigencies using reversible and/or flexible technologies, with hyper light textile based components, active structures and

smart solutions. The interventions on historical built environment are nowadays asked to deal, referring to resilience, with other particularly urgent aspects, such as: environmental risk management (landslides, earthquakes, erosions, etc.), control of the impacts of urban and industrial development (especially in the geographically sensible territories), landscape planning (coasts, natural parks, mountain districts, etc.), adoption of the Community objectives and directives (Agenda 2030, ONU and UNESCO programs, etc.).

Finally, the multiple aspects of the concept of resilience applied to the architectural heritage (and to every intervention concerning it) can give a contribution to a broader outlook on the disciplinary ambits of Architectural Technology. In an attempt to transform the architectural heritage from resource to opportunity, it is possible to reinforce the contribution of the technological design to the process of epistemological and systemic revision of sustainability. This objective, that cannot be postponed, becomes increasingly more tangible and realistic also in the short term, when adopting a cultural, creative and participative significance, being always aware of the available instruments.

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