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A decision support system for preservation and reuse of the cultural heritage

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Introduction

The present work regards the development of a decision support system for aiding municipalities in making decisions on complex urban regeneration policies such as the reuse of cultural sites (historical building or urban spaces).

For most European cities, with a centuries-long history, this issue is very important but also extremely complex. Indeed, on one hand, the urban needs and uses change over time, on the other hand, in order to preserve the city's identity, the cultural sites can only be transformed within an eligibility threshold. In addition, today, many other factors, such as climate change or the globalization, can have a strong impact on the cultural heritage and its preservation. Furthermore, although the European Union has identified the cultural heritage as a key economic resource, the available financial resources are rather limited.

In this perspective, it is very important to support the decision makers that have increasingly limited resources for a non-renewable heritage (as the cultural sites), clarifying opportunities and reducing risks of the transformations.

In this short paper, we will present a methodology for the selection of sustainable uses or projects by considering both the constraints of cultural heritage and the preferences of stakeholders.

Issues and proposal

Today the reuse of cultural heritage takes on new meaning related to the sustainable city paradigm. Indeed, the compatible reuse of the cultural sites has always helped the preservation of the cultural heritage over time, but now the interest in reuse focus also on the possibility to foster the urban sustainability. One of the recommendations for sustainability is the reuse of the buildings and spaces because contributes in making better use of what we already have without increasing land or energy consumption.

Therefore, actions for adaptive re-use has potential positive economic/ environmental effects, and when they involve local communities, by activating processes of social innovation, can have a very positive social impact. When actions for adaptive re-use regard the cultural heritage (monuments or historical buildings, complex of buildings or entire neighborhoods such as historical centers, open spaces or historical gardens, etc.) their potentials are to be considered in terms of cultural and identity values too. It is necessary to consider tangible and intangible aspects, compatible uses or activities (arts and crafts, etc.), a sense of belonging, constraints, and limitations etc. The adaptive reuse of cultural heritage should have minimal impact on its historical significance and its setting.

For this reason, the reuse of cultural heritage has seemed, sometimes, more difficult to realize; however, in the last years it has appeared a renewed attention for the preservation of the cultural heritage, due to the identification of economic (e.g., Tuan and Navrud, 2008) and not economic advantages (Blake, 2000).

While the recognition of the impact of cultural heritage on tourism is well established, also by governmental organizations (e.g., McKercher et al., 2005), other effects and influences are also acknowledged as creating social inclusion (Vasile et al., 2015) or community engagement (Waterton, 2015) or improvement of the environment and the urban landscape (Veldpaus et al., 2013). It can also help to revitalize areas as, for example, the rural ones (Briedenhann and Wickens, 2004). For these regions, the local and international agencies promote the restoration of historic buildings, but also encourage the public awareness of cultural heritage, motivating governmental institutions to act for the preservation of local and national heritage. For example, the UK government has recently created a council for the management of the English heritage. Furthermore, also developing countries are increasing the investment in the sector. The involvement of the communities has massively increased with several initiatives as the search for additional sources of funding through the crowd-funding has been very much encouraged even.

However, in the current contest, a serious decrease in investments is leading the authorities to attempt to involve diverse organizations, groups, and actors interested in re-using abandoned properties.
The involvement of private sector along with other kinds of stakeholders seems to be needed, both because public funds are nowadays more difficult to obtain, and because it is unlikely that the Municipalities would be able to manage these sites alone.
In this way, cultural heritage, involving a variety of values, can trigger either top-down or bottom-up actions and can lead the urban regeneration.
However specific approaches are needed to support the local authorities in an interactive decision-making procedure that aims at finding the available resources and steering them in the right direction. Therefore, we needed methodologies capable of:

- considering different points of views and objectives (multi-objective approach)
- involving different stakeholder in the whole process supporting the identification of shared decision (interactive approach)
- considering each action as a part of a unique program, since the expenses must be rationalized and some constrains taken into account (portfolio decision analysis approach)
- defining the priority among many actions (prioritization approach)

Therefore, it is essential to integrate different approaches to support the decision-makers in the selection of the better portfolio of actions to be implemented. In this paper, we propose a methodology that can support the policymakers in this direction. In particular, our methodology consist of these phases (Barbati et al., 2018):

- Identification of the decision problem: identification of stakeholders and their points of view, criteria, actions and their performance for each criteria, and constrains;
- Prioritization of the actions defined by means of a multicriteria sorting method;
- Selection of a portfolio of actions, through an optimization process that identifies the maximum number of the actions that have the highest priority and do not violate any constraints;.
- Robustness analysis to test the stability of the results with respect to the variability of parameters in the model.

The procedure we are proposing is strongly interactive in order to take adequately into account the heterogeneous objectives pursued by the plurality of actors (policy makers, stakeholders, analysts) involved, in the decision process
In particular, after prioritizing the feasible actions though a sorting method (e.g. ELECTRE TRI NC), a multiple objective optimization problem can be formulated in order to identify the most adequate portfolio of actions taking into account on one hand priorities, and on the other hand the different points of view and the specific constraints related to the policy makers and the stakeholders involved in the decision process. Along al the process a specific care is taken to permit all the actors to contribute at the design of the most appropriate urban policy.
The whole procedure permits also to formulate justifications and argumentations useful to the involved actors for acknowledging the goodness of the proposed solution, as well as to support the adopted decisions in communication towards a third party and public opinion.

Conclusion

The methodology proposed aims at:

- better directing the scarce resources available in the selection of the projects to be achieved;
- improving the transparency of the choices aimed at transforming the natural, built and historic environment and the cultural assets.

Through the interaction with different actors, it is possible to analyze the reuse of cultural heritage in terms of benefits for the city, the citizens and the stakeholders, in a process that involves a multiplicity of cultural, economic, environmental and social features.

Notes

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