

COMPLEX URBAN SYSTEMS, DIGITIZING AND REAL ESTATE APPRAISAL

This issue of the journal starts with a wide-ranging space and time essay, devoted to the real estate markets in Paris and New York. It focuses on the digitizing of the cadastral and historical mapping, in two essays; it addresses the topics of the urban quality, in terms of “walkability”; it goes back on the issue of the sale of public real estate; and in the end, it addresses the increasingly relevant topic of the transformation value for the real estate appraisal.

Serge Salat’s essay is especially dense on the theoretical, analytical and interpretative level. The author – who is the President of the Urban Morphology and Complex Systems Institute of Paris – applies the multifractal analysis to urban structures, which are considered such as complex systems determined by the interaction of multiple factors. Even if the big cities studied by Salat present original features (*i.e.*, morphological, architectural, social, economic, and so on), which make them different from each other, at the same time they might have “hidden links” in common determined by mathematical regularities, such as the instance of energy density and of land allotment, which imply that they belong to the same “universality class”. In particular, Salat considers “land allotment” as one of the elements that more frequently feature inertia on the long term, and in particular, he analyses the scale hierarchies in the urban allotment plan of Paris and New York in a much longer period, that is eight centuries, from 1215 to nowadays. These two realities studied by Salat, even if not comparable on the historical, economic and social level, might feature urban structures which are at the same time irregular and marked by similar scale hierarchies. In fact, both respond to the invariance scale inverse power laws, that is to say that they might be characterized in the land allotment by the same scale factors, even over the ages. Putting together urban structures, land allotments, real estate markets and energy consumption, Salat’s studies introduce new interpretations of the urban phenomenon on different scales, and may have relevant implications on the aspects connected to the environmental sustainability of the cities.

Etienne Lepage and Cyrille Goulard introduce the French Cadastre, which defines the tax base of real estate and ensures fair taxation while the rights to the property are reported in the real estate registry, as well as the Italian Cadastre. Since 1955, France has recognized the importance of relating the cadastral records and the land registry, in order to allow cross-references. The authors trace the process of computerization of the cadastral cards and maps by the activation of the associated web mapping services, in order to anticipate the new “Unique Allotment Representation (RPCU)” project, which provides that the cadastral map constitutes the only legal document containing land and allotment data. The authors claim the benefits of computerization in France, concerning the public administration productivity, the real estate professionals, and in particular, the citizens.

The issue of digitization is also addressed by Marco Roggero and Anna Soleti, for what concerns historical cartography and its relation with the recently digitized cartography: a topic that may have important implications both in the historical research and the development of cultural, material and immaterial heritage, if we also consider it in terms of geo-referencing. The authors consider the photographic features related to geometry as well as the radiometric quality of images. They address the question of the distance measurement of the historical cadastres, of the photographic digitization (by means of the acquisition of a single image for each map) and the photogrammetric three-dimensional digitization (by means of the acquisition of three-dimensional data with point clouds), by using geo-referencing (by means of the triangulation or interpolation polynomial method).

Ivan Blečić and others address the topic of the urban quality by considering as a relevant requirement the *walkability*, which is the quality of accessibility considered in relation to the pedestrian mobility.

The authors represent a multi-criterial and spatial model for the valuation of walkability, meant to measure the quality of the paths and usable as an instrument to support urban decision and planning. The innovative aspect is the methodology and the valuation software introduced by the authors – that is Walkability Explorer (WE) – able to consider not only physical features, but also qualitative factors, such as the sense of hospitality, the imaginative stimulation, and the “space liveliness”. The application to the city of Alghero turns out to be peculiarly interesting, as it builds *walkability* maps with rates concerning commerce, facilities, free time, and it differs the possible user profiles (tourists, parents, cultural services and education). Furthermore, it should be highlighted the ability of the software WE to evaluate the impact that urban projects or works on the road network may have on the future *walkability*.

Cristina Coscia and Alessia Mangialardo also experience the techniques of decision support about the disposal of state properties of historical, architectural and environmental interest, which in our country aims to acquire resources in order to support critical issues concerning public finances. In fact, due to the market crisis and the absence of public resources, in spite of the high historical, architectural and environmental value, the state properties did not reach the cost/benefit appraisal of the privates and have remained unsold. The authors focus on the case of the Citadel of Alessandria, which is relevant because of its historical value and size, for being an object of study and revaluation project proposal since 1998, and for being included in 2014 in a call for the concession of the Citadel to privates. After carrying out the degradation analysis and estimating the total cost, equal to 265 million Euros, Coscia and Mangialardo compare the methodologies of strategic appraisal to apply to the Citadel of Alessandria and apply the Analytic Hierarchy Process (AHP) to evaluate alternative management models concerning functional, social and economic criteria and sub-criteria. As further audit of the results, the authors experience Saaty’s Analytic Network Process (ANP), which includes interaction among the different aspects in order to make the system to be evaluated more responsive to the complexities of reality.

Maurizio D’Amato addresses the issue of how to calculate the value that real estate (land, but not limited to) takes in relation to its transformation potentials, by considering the International Valuation Standards and referring to the so-called *Extraction method*. While mostly used in the past as an indirect method to calculate the market value of the building land, the transformation value holds today a renewed interest, as it can also be applied to determine the value of existing buildings, which are degraded on the physical and functional level but are likely to be restructured and destined to new functions. In particular, the author considers the prediction of the value of the property that results from the soil processing, in the cases where data is insufficient to use multiple regression analysis. D’Amato relates to the *Market Comparison Approach*, of which he experiences a “Reduced data table” variant, which he applies to an actual case in Bari. The results may be extended to cases in which it is necessary to determine the value of properties under construction “*investment property under construction (or reuse)*” by means of the method of the future value.

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