

# The grammar of the house and of the city. Theoretical approaches for generating project

Salvatore Giuffrida\*

*keywords:* constructive, selective and generative grammars;  
object/performance/value-based approach;  
project, program and plan; fact/value/merit-judgements

## Abstract

*This contribution presents the conceptual premises and some methodological aspects of a general evaluation model to support the urban fabric redevelopment project of the historic city. The model, in its general directives, is tool superordinate to the project, which enables the functions of evaluation to generate a multiplicity of possible alternatives. The model is consistent with a representation of reality by objects and characteristics, starting from the identification of the minimum units of study, the "value bearers", and their representation in the space of the project by means of a large number of terms of value; this information base is created by means of a multiplicity of formalized observations in a unitary lexicon and collected in an extensive database.*

*The strong characterization the historic urban fabrics can be the reference of renovation policies, which, recognizing the significance of these forms, generate the arrangement of conservation and change – the rule and the exception.*

*The theoretical core of this contribution is the relationship between urban forms and the three main grammars: constructive, selective and generative.*

*A constructive grammar-based approach prescribes*

*the elements to be used and the ways in which they must be put together, according to a typically object-oriented approach, based essentially on the constraint imposed in highly structured contexts that admit only minor variations with respect to the consolidated and recognized norm.*

*A selective grammar lists the elements to be combined and the combinations to be avoided, allowing ample possibilities for reforming weakly structured contexts. No definitive form is ever supposed, coherently with a performance-based approach, since the elements are combined according to an overall logic that is part of the context with reference to its perspective, to values not yet present.*

*A generative grammar is a system of rules the combination of which allows to produce a potentially unlimited repertoire of expressive forms coherent with these rules; consequently, these forms can be compared if they are consistent with present and future values. This grammar is consistent with an axiological approach referable to a system of values, rather than just rules, which implement a broad social and eco-systemic prospect.*

## 1. INTRODUCTION. “ADVENTURE AND ORDER”, PROJECT AND EVALUATION

The city, though through its most varied manifestations and identities, is the most durable form in which the surplus of social product has been accumulated over time. Its plurality is condensed into a general substance, the value, whose density makes the city omnipresent and resilient.

The city is a socio-territorial reality able to increase in value, accumulating much of the surplus produced, which in this form can be used for future consumption. As such, the city has a specific ability to be worth itself, and to attract and condense the wide variety of economic energies that run through it into a limited range of assets.

The city is the densest form of social capital and for this reason it is a field of value that gives shape to the multiple and conflicting individual axiologies present in it; the city is a structure that generates new norms and forms, a bifurcating system of constraints and opportunities: the evolution of the city testifies to the gradual adjustment of the amount of wealth produced and the many asymmetries that it gives rise to when distributed in space, between centers and suburbs, and in time, between stocks and flows of wealth, in the social fabric, as to the differentiated possibilities of access to the most valuable urban services.

The succession of artefacts and institutions in the progress of the city testifies to the continuous adjustment of wealth flows in stocks of social capital, both material and immaterial, and its progressive standing as the reference for defined settlement and behavioral patterns and the brand of local communities and territorial networks in which people sharing this dream gathered.

The vastness and versatility of the urban phenomenon and the hyper-complexity of the modern city are not the subject of these reflections which, instead, address a well-defined area of the city, the building fabrics, with a purpose and for a consequent reason.

1. The purpose is the progressive approach between appraisal and architecture sciences, by:
  - reconsidering of the notion of real estate assets, a typical subject of traditional appraisal, whose values are centered on the property rights and are measured in money;
  - overcoming of the notion of building construction, the typical subject of the theory of production and logistics, and whose values are represented as performances and costs (Fattinanzi, 1992; Gwang et al., 2004);
  - the affirmation of the notion of architectural heritage, which:
    - first, refers the assessments to the notion of social capital, a public-private dimension that reinterprets the concept of “property rights” as the “rights to the city”, the privilege of ownership, the duties towards

the local community;

- second, refers the architectural heritage value to the dialectic between the concept of the “work” and the concept of the “product”, two important aspects of the notion of capital, respectively: the iconic profile, that is its ability to hold itself; the sign profile, outlining the possibility of being worth in relation to the underlying, the stream of housing utility; these two dimensions, the capital stock value and the rent stream value, respectively converge in the capitalization value, still a monetary measure, but including all the economic variables – income, financial and monetary – involved in the production and accumulation of wealth.

2. The reason is the focus on the urban fabric due to: the aforementioned purpose, pursued with the detailed description and characterization of the architectural heritage studied; the insuperable boundary separating project and evaluation: the former is inspired to “adventure”, the other to “order”. The identity of the historic city, in particular, is due to that sort of inertia – physical, technological and economic – mainly due to the prevalence of the material underlying who have preserved the anthropological structure and the cultural values, both individual and collective, which at the same time it guards and shows.

The complexity of these two forms of being worth is related to:

- a “functional order” (in a broad sense), which represents how natural constraints have been transformed into the forms of societal living, consolidating the relationship between the space of the house and the space of the city;
- an economic order that represents, instead, the way in which, starting from these relationships, the individual values have been consolidated in systems of stable preferences.

On the other hand, the sudden change in this balance – mainly due to the affirmation of new cultural models, especially starting from the past sixties, due to new technologies and to the overall increase in personal income – has modified above all the perception of the relationship between form and function, moving the center of gravity of the architectural quality outside the values of the formal and constructive tradition and its continuity.

The permanence of that order, where its inertia or recognition have preserved it, identifies the historical (prebellical) city as an “inemendable gesture”, an “unintentional form” standing itself, an inalienable condition of “the urban being” of the settled communities and consequently an “order that admits few adventures”:

*Every adventure is a norm to come; every conduct tends inexorably to turn into custom [...] It is a painful and necessary truth, the awareness that the individual*

*can experience few adventures in the exercise of art. Every age has its own peculiar gesture and the only creative enterprise lies in emphasizing that gesture. To understand that every adventure is inaccessible and that our most loose movements flow along predetermined destinies like those of chess pieces, it is obvious to the man who has passed the tortuous peripheries of the art and who confesses, from the top of the clear terraces, the indestructible rectitude of the city. To be proud of this submission and to practice it with devout observance, it is typical of classicism. [...] Adventure and order ... I like both disciplines, if there is heroism in those who follow them. The one shouldn't look too much at the other.*

Borges, 2007, pp. 62-63

The experimentation in the evaluation of the redevelopment of historical urban fabrics has shown that as much as design and evaluation are non-autonomous activities, each of them enables cognitive functions informed by specific motivations or intentionalities: the evaluation those related to “order”, the project those related to “adventure”.

In fact, on the one hand the project cannot be drafted if the current and final status are not logically connected, on the other hand the evaluation verifies the value judgment and its constitutive statements, taking into account the conditions of uncertainty, incompleteness of information, presence of multiple axiological profiles, converging or conflicting.

More generally, the disciplinary specificity of evaluation, consists of making explicit, organizing and modeling the project's motivations allowing to generate a multiplicity of alternatives.

## 2. MATERIALS

### 2.1 “Value density and tensions in prices”. The ghosts of the urban regeneration

The value that has consolidated in the architectural-urban fabrics of the historic city is a non-reproducible resource, destined to run out in contexts of “low density of value tension in prices”, affected by constant outflows of demographic and economic energies. This heritage is “value without wealth”, an unexpressed potential due to the interruption of the necessary financial flows, whose resilience is entrusted solely to the material inertia. The fall of these contexts into the abandonment trap is the premise, often skillfully driven, triggering urban regeneration programs, the are the heaviest and most devastating redevelopment processes in fragile social urban contexts (Curto and Fregonara, 2019).

Here this value is still accessible to families and young people, and the current owners must be deterred from abandoning the original house in the historic center, by encouraging processes of redevelopment from within, the persistence of social fabric, that is the physiological

relationship between local income and real estate market prices.

This value has been stratified into artefacts, according to organized forms (which the institutions appointed to give this material order and perspectives have supervised), now lapsed due to the sudden upheavals of the economic-productive order. The financialization and planetarization of the real estate industry, and the lack of forms of real local economic development are increasingly impoverishing these assets.

It is well known that slow bottom-up development processes generate a larger and more complex value differential than its “monetary measures” can capture, and that market prices are an insufficient simplification of the economic energies of a settled community.

In the logic of urban regeneration, facilitated by the concentration of ownership (Carter and Roberts, 2017), changes in market prices (the medium) become the central concern of medium-long term redevelopment policies (the end). The breath of the city gets shorter following the rhythm of the real estate cycles.

These simplifications have overturned the relationship between evaluation and project by selecting partial evaluation tools, suitable for highlighting the advantages and hiding the disadvantages (Kyrkou and Karthaus, 2011). Therefore simplified assessment patterns based on rating have been affirmed (Berardi, 2013; Elgert, 2018; Hemphil, 2004; Sullivan et al., 2014) rather than on the identification (and generation) of (new) values, and which have packaged “urban products” with high energy, environmental, functional performance etc. (Fregonara et al., 2018; Giannelli et al., 2018; Sharifi and Murayama, 2014), suitable for being represented in the real estate asking market price system.

The urban fabrics are thus dismembered in new central areas determined by exclusive locations (Gould and Lewis, 2012), and the new price map deforms the “anthropo-graphy of the values”; the real estate voluptuousness turns the historic centers into the target of a flurry of trades that “fills them with gaps”.

This “rational euphoria” affects the relationship between urban and human capital: the population structure; the neighborhood models, the integration between residential and economic activities; the arrangement between stable and seasonal residential functions.

If relevant concerns relate the historic centers blessed by this fortune, more serious worries arise for those characterized by the prevalent urbanistic or “context” value, rather than architectural, or “co-text” value. In linguistics, the con-text is referable to the “order of conventions”, while the co-text is the most specific area of the punctual asymmetries rising to the “adventure of conversations”.

Con-text and co-text defects condition the building activity in lower density value historical centers:

- the con-text gaps are due to the the difficult symboliza-

tion of the urban value at the scale of the settled community, whose institutional actions do not assume the physical and relational support of this value as the raw material and as the main target of urban policies;

- the co-textual gaps depend on both functional and economic issues, and are due to the individual choices aimed elsewhere – localization in the periphery, building substitution; they characterize the socio-economic and real estate contexts in which personal income does not allow to incur the renovation costs, which cannot be covered by adequate increases in the real estate market value.

These two layers of the social-urban communication influence each other, for better or for worse; the convergence of economic and aesthetic positive or negative values triggers processes that feed on themselves in the opposite directions of degradation or gentrification, and that must be properly addressed.

Furthermore, concerning the potential of subsidiarity, the negotiation between the public and private sectors and finally between stockholders and financial (real estate) stakeholders has shown that the prospect of greater transparency and efficiency in the allocation of the wealth created is strongly shortened due to contingent complexity, heterogeneity of situation, viscosity of process and lack of information (Oppio et al., 2019; Oppio and Torrieri, 2018; Oppio et al. 2018) which in some way contradicted its own meaning thus obtaining results contrary to the possibility of resolving, in a spirit of cooperation, the conflict between contingent needs and enduring structures.

That is to say, it is not sufficient, in the economic accounting, to make explicit and isolate the strategic economic categories by negotiating the distribution variables, since the latter are hidden in the many organizational and administrative contingencies that influence the profitability and responsibility profiles.

These and other possible arguments support the research on the relationship between evaluation and project, in the perspective of the formation of approaches based on the rules of the “palimpsest”, a form in tension between conventional values and singular preferences, between structural course and corpuscular events, between normativity and creativity.

## 2.2 Behavioral addresses. Conservation and transformation

This contribution proposes reflections on some conceptual fundamentals of the urban redevelopment process, such as in the case of consolidated urban fabrics, substantially “bipolar”, where, due to the presence of multiple values, neither the instances of conservation nor the needs of transformation clearly prevail. In particular, these reflections concern contexts characterized by several kinds of wealth streams placed within the wide

range defined by the individual interest and public value. For these reasons, the built environment redevelopment strategies cope with the substantial axiological disorder that has allowed the indiscriminate diffusion of technologies and the exhibition of new wealth in an anarchy of forms that could hardly be reduced.

The lack of an evaluation support integrated in urban policies and institutionalized in “command and control” measures is the result of the decision-making inertia and poor planning attitude.

The following considerations set out the reasons and the ways in which the design alternatives aimed at regulating the building activity within a consolidated urban fabric interpret the evaluations and settle in internally and externally consistent forms.

The most critical aspects of the *modus vivendi* between interests and values, individual and community, needs and desires, state and market refer to the general and conceptual opposition between the rule and its exception – between order and adventure, as mentioned – thus reflecting the linguistic nature of the architectural-urban fabric and its textual coherence in the unity of the urban landscape.

A grammar of the house and of the city is outlined here to explain in what sense the urban textual unity (Curto et al., 2018) is threatened by transformations due to the inability of the rules consolidated in urban fabrics to induce behaviors, to demand respect. These reflections, however, do not include the cases of infrastructural development works, since these determine clear interruptions in the system of rules with respect to which the coherence of an urban element is recognized in its unity of landscape, and for this reason they exceed the knowledge consolidated in the building practice and in the collective imaginary.

This experimentation focuses on the creative possibilities of an evaluation model, therefore on its ability to define and set the “order” of the “design adventure”, so that the project is consistent with the original rules, which justify or suggest how and in what extent they can be exceeded.

This “unity of purpose” on the part of evaluation (the rule) and project (the exception) was tested with reference to one of the most relevant planning tools for the bottom – up redevelopment processes, the management of the building works over a heterogeneous urban context, that is characterized by the presence of architectural-urban values that are consolidated but not “self-sufficient”, so that these values can be affected by the multiple possible interpretations of the detailed plan rules.

The management of the building works over a consolidated urban fabrics is regulated starting with Law 05/08/1978 n. 457 introducing the main Categories of Intervention (CI), redefined of the art. 3 of Presidential Decree 06/06/2001 n. 380. The arrangement of the

regulating the building interventions today largely supported with tax deductions, constitute the set of constraints and opportunities in which the quality of the Architectural Units (AU) is reflected.

The identification of the AU as a minimum unit of study – ie observation, description, characterization and quantitative-monetary and qualitative evaluation (Boscarino et al., 1994) – of the urban fabric, is the main graft of the valuation science in the large trunk of the architectural sciences, of the assessment in the project.

The overall structure of the CI, and therefore the balance between a conservative or transformative intentionality, constitutes the way in which the detailed urban planning tool manages the opposition between “adventure and order”, that is the way in which the creative gesture (aimed at economic-real estate development) adapts to the solid basis of underlying values, that, although consolidated overtime, are not unanimously recognized.

### 3. METHOD. LANGUAGE AND THE URBAN GRAMMARS

#### 3.1 Language and the “reality to us”

The premises that apply to the city as social capital and consequently as set of oppositions (stock/stream, individual/group, interests/values), belong to some general categories of language and grammars.

“Reality is a jumble of mixed perceptions: language is an effective organization of that enigmatic abundance of the world”.

Borges, 2007, p. 43

Language is first of all the division of the sound mass into meaningful units. This distinction enables the semantics and delimits the fields of meaning within which they consolidate and evolve. The relevance of language for the very existence of the individual is linked to the perspective of the social order.

Language combines:

- *Lingue*, the norm, the sum of the prints common to all the speakers but independent of their specific determinations;
- *Parole*, the gesture, the sum of the individual speech acts as voluntary acts keeping alive and renewing *Lingue*.

In our interest area, multiple oppositions can refer to the *Lingue/Parole* dialectic: city and architecture, conservation and transformation, public and private, state and market, values and interests. Each of them enables the relationship between the rule and its overcoming, between norm and gesture.

Language is the constitutive material of communication which enables opposite and complementary functions:

- at the base, the need for an effective (explicit and inclu-

sive) communication has codified the grammars, the rules for sharing knowledge made possible by the linguistic representation;

- at the top, the possibilities of a selective communication (implicit and exclusive) have developed the rhetoric, whose forms and figures, increasing the ambiguity of the messages, selects the subjects admitted to the exclusive benefits of this specific communication; the latter master the code by which they juggle in the intertwining of meanings from which they infer the intentional meaning of the discourse.

Grammar and rhetoric (still “order and adventure”, therefore) both operate in language, and use it with potentially divergent aims and results.

An aspect that can clarify the operational interest of the linguistic nature of the architectural phenomenon and the grammatical nature of the evaluation of quality in the architectural design, can be found in the American structuralism by Bloomfield, according to which grammar is the way in which the forms endowed with meaning (semantic elements or signs), free or linked, are arranged:

- the free ones give rise to syntactic constructions – syntagmas, propositions, statements – and are based on the function of the elements regardless of their form;
- the linked ones give rise to morphological constructions and are based on the shape of the elements and on their aptitude to change (bending).

A grammar of the home/city system is the set of rules that govern the combination of elements characterizing architectural objects as well as urban aggregates: semantic elements or signs can be considered free when their meaning is independent of the context, while they are constrained when they take (give) meaning from (to) the context by modifying themselves to adapt and join the other contextual elements. The bending (declension of names, conjugation of verbs) is the way in which the semantic elements are modified to combine into meaningful forms that are more and more complex, thus expanding the possibilities of signification and expressiveness of sentences.

The bending is the distinctive characteristic of the most advanced languages – “inflected”, in fact – with respect to those “agglutinating” and “insulating”; in the same way, the combinatorial variability of the types and the functional flexibility of the architectural works are the most relevant qualities of the evolved architecture practice, more capable of facing the challenge of adaptation to the social-environmental changes.

This is the added value of the historic city, given that the process of industrialization and the model of growth of the contemporary city no longer reflects, except in rare cases, the rules and possibilities of bending.

Table 1 shows a non-exhaustive example of the correspondence between the basic components of grammar of language and grammar of home and city:

**Table 1 - Correspondances between the basic components of grammar of language and of home and city.**

Grammar of language	Grammar of home and city
<i>Phoneme</i> : phonic element able to distinguish meanings	<i>Building material</i> (timber, plaster, glass...)
<i>Morpheme</i> : minimum signifying unit; lexical m. (root: <i>friend_</i> ); grammatical m. (inflection: <i>_s</i> )	<i>Element</i> (warping, frame, double-glazing...)
<i>Lemma</i> (word, lexical unit, entry in the dictionary or encyclopedia)	<i>Component</i> (floor, opening, window frame...)
<i>Syntagm</i> (syntactic component: "the cat called Isidoro")	<i>Architectural unit</i> (building)
Sentence (elementary statement)	<i>Block</i> : aggregate of buildings linked by a structural connection
<i>Prase</i> : real segment of the discourse related to a communicative situation implying the responsibility of the speaker	Neighborhood
<i>Text</i> : reasoning, story with an authority (religious, the Appraisal handbook); autonomous and self sufficient narrative/descriptive unit	City

The distinction between free and linked signifying forms metaphorizes two important poles of the urban narrative:

- at the apex, the free forms, monuments, which display an iconic function, are worth themselves, determine the surrounding context, symbolize the unity of the community and its identity;
- at the base, the linked forms – the housing performing a sign function – are worth depending on the context from which they derive their *raison d'être*; this forms signal the intimate and everyday dimension of people in neighborly relations, represent the shape of the functional contiguity in the building continuity when the architectural types (lexical morphemes) aggregate modifying their contact elements (grammatical morphemes) to rise new signifying forms and sometimes unexpected expressions.

### 3.2 Grammar, plan and project

Grammar, in general, studies the way in which significant forms give rise to communication in a formally complete way, but regardless of the meaning expressed by the sentence. A set of rules oversees the formation of "well-formed sentences". These rules "govern the

phonological, morphosyntactic and lexical systems, to whose complex interaction the functioning of the language is due" (Vineis, 1994, p. 371).

In the interpretation and transformation of the historic urban fabrics, an urban grammar can be assumed as the set of rules with which the repertoire of objects, properties and functions is organized, and whose management intervene on the signifying forms with the aim of achieving "a well-formed (con-)text".

Following is the distinction between constructive, selective and generative grammars (Moro, 2006), the last of which will be presented in more detail in the next section.

A **constructive grammar** provides the instructions for a "well formed sentence" (what needs to be done). It is consistent with the traditional approach to the city, a planning process based on the combination of conformative and expropriation constraints. These constraints work as a redundancy system allowing the decision maker to defend the conservation process from regulatory gaps or from architectural heritage uses that do not comply with the rules when these are arbitrarily interpreted. In linguistics: the source sweeps the message with a clarifying surplus in order to reduce the risk that gaps in meaning or ambiguities may induce the reception to understand different meanings, as in the case of selective grammars (Rizzo, 1999). The "object-based approach" in the architectural design can be considered an application of constructive grammar.

A **selective grammar**, on the other hand, provides the elements to be combined and a list of combinations to be discarded (what should not be done) such as general principles or meta-rules whose recursive interaction selects well-formed sentences. It is typical of the urban plan in contexts in progress or weakly structured, where the general principles of the creation of the urban space are made explicit never supposing definitive forms and models to be reproduced; such an approach risks giving rise to inappropriate combinations which become useful experiences for the understanding of the general functioning of the combinatorial mode, but above all it stimulates the production of new forms without imposing any. A similar approach is typical of the plan based only on just conformative constraints that indicate some of the project, but not its contents, and above all it is open to the occurrence of contingent changes in terms of needs and resources. A "performance-based approach" to the project is inspired by a selective grammar.

### 3.3 Generative grammar and strategic urban programming. An "axiological approach"

A generative-transformational grammar is an iterative system of transformations producing a potentially unlimited repertoire of expressions according to a limited set of rules (what can be done). It is typical of

strategic planning in structured and developing contexts, affected by specific and widespread criticalities, as in the case of the historic “not monumental” city, where the urban quality prevails over the architectural one, and there is a substantially stable relationship between the inhabitants and the housing asset. An axiological approach to project is typically inspired by a generative-transformational grammar.

In the generative-transformational grammar by N. Chomsky, the two fundamental dimensions of language (*Langue* and *Parole*) are taken as “competence and execution. Competence is the knowledge of the rules that allow the native speaker to associate phonetic interpretations (signals represented phonetically) with semantic interpretations; the speaker progressively internalizing the morphosyntactic rules immanent in his own linguistic system, is capable of producing an infinite number of grammatically correct sentences, and of judging the grammaticality of the statements produced by the interlocutors” (Vineis, 1994, p. 371). Execution is the ability to use the knowledge of these rules.

The reference of programming is not the object itself, but the implicit knowledge that produced it (the competence of the speaker), not the matter but its form, not the outcome but its conditions, not the effects but their causes, not the actions but their motivations; the programming (execution of the competence) generates strategies that are internally and externally coherent.

An “urban text” is formed by a multiplicity of contexts characterized by a certain morphological structure that makes them recognizable (i.e., as “well-formed” grammatical sentences), or which allows someone to recognize inconsistencies (non grammaticalities); these textual units, in turn, are composed of syntagms, fulfilled objects such as the Architectural Units, which can be simple or very complex as regards their attributes and the relationships they have with other objects or events or functions, and thus can assume a different weight in the arrangement of the relationship between deep and surface structures (urban identity and Intervention Strategies).

According to “generative-transformational” approach, the presented model finalizes the cognitive and evaluative process – aimed at identifying coherent classes of building types so that the most appropriate Ci can be associated to each AU – to strategic planning.

This model:

- is generative because it defines and declares the rules for assigning the appropriate of Intervention to individual AUs;
- is transformational because it recombines, in an iterative manner, these rules by rewriting the expressions until the most suitable to achieve the continuity of the historical city;
- is strategic (Healey, 1997) since it organizes the rules previously set on the basis of hierarchized criteria, and

provides reasons and purposes for the most appropriate choice (of expression), given that grammatical consistency (the means) is independent of the sense (the end) of the text, which instead represents the complex interaction between the intention of the speaker (incoming information) and meaning for the user (outgoing or assimilated information).

In order to emphasize the generative-transformational essence of the model it may be useful to specify that:

- the “competence” consists of the impressive data base that the model coordinates and transforms into the attributes of the AUs; specific value functions define semantics and measurements.
- the “execution” consists of the production of different strategies (expressions), each corresponding to the way in which the competence is used while keeping the rules alive, and operating, coherently with the relationship between the characteristics of the building-urban fabric and its evaluations.

The expressions produced by applying the “rewriting rules” can have a more descriptive or connotative function. That is, they can employ the linguistic material in a more or less free way, according to the lower or greater internal textual coherence of the AUs. A wider or narrower prospect of a new structural arrangement, new functions, new distribution structures, etc. can arise.

The rewriting of the intervention strategy, as an expression, consists in making it pass from the “descriptive” level (conservation) to the more “connotative” ones, in order to create more densely communicative expressions (transformations).

Consequently, the ability to optimize the strategy depends on the possibility of modifying it by maneuvering the rewriting rules, i.e. releasing the constraints that hold a AU within a conservative CI, so that they move towards the next, more transformative, one. Therefore, each of the generated expressions is:

- internally consistent since the same rules are applied to all AUs;
- externally coherent since it is developed according to the same rewriting rules.

The linguistic material, therefore, gathers around the syntagms, the AUs, minimal information/valuation units, and target of the program requirements, the CIs.

The typifying process defines the syntagmatic identity of the AUs. Each of them is identified as a consubstantial set of object and property (D’Agostini, 2013), with respect to which it belongs to a species, the type.

An optimization process of the strategy, as mentioned, is the iterative production of multiple versions (expressions) which involve linguistic material differently; assigning a different CI means supposing a different function for each AU: a conservative CI (“Restoration”) requires that the UA has and must keep

working as an “icon” (keeping the original structure), and not generically as a “sign” (as well as in the case of intended uses modifying the structure but not affecting the relationship between characteristics and value.

### 3.4 The model

The general purpose of the model is the identification of the best Intervention Strategy (IS) for the building fabric, i.e. the best structure of the CIs, according to:

- a discreet approach, generating a series of alternatives among which to choose the best;
- a continuous approach, providing the best strategy progressively approaching the optimal solution.

The model consists of a central core that allows us to assign a CI to each AU by combining the intentionality of the decision maker and the axiological identity of the AU. This is associated with four coalescing modules:

- the first is aimed at attributing each AU to a Building Type;
- the second is aimed at calculating the costs associated with each CI for each UA;
- the third is aimed at calculating the real estate market value of the UA, with respect to location, intrinsic, technological and architectural-environmental characteristics (Giuffrida et al., 2017), in the situations before and after the works, in order to calculate the economic profitability resulting from the application of the CI attributed;
- the fourth is aimed at evaluating the different strategies generated, performing a simplified model of Multi-Attribute Value Theory, highlighting the preference pattern supporting the choice of the IS that best fits the decision maker prospect, or the progressive adjustment of the thresholds enabling the constraint release (Giuffrida et al., 2013; Trovato and Giuffrida, 2014a; 2014b; Giuffrida and Gagliano, 2014).

The model allows us to outline multiple Intervention Strategies, ranging from the most “restrictive” ones (only “Maintenance” and “Restoration” are supposed) to the more “expansive” ones allowing a high number of AUs to be associated to “Renovation”, “Demolition with Reconstruction”, “Volume Integration.”

A CI is a set which each AU belongs to because its attributes according to specific (if ..., then ...) logic functions. Each AU is assigned to a CI,  $CI_{hk}$  – where  $h = (1, 2, \dots, 5)$  is the number of CI groups (1. Ordinary Maintenance, 2. Extraordinary Maintenance, 3. Renovation, 4. Demolition and Reconstruction with or without volume increase, 5. Restoration), while  $h = (1, \dots, 3)$  is the AU’s maintenance state (at which it is expected a slight intervention, medium or large) – on the basis of a set  $v$  of constraints assumed as representative of a higher-level system of values  $V$ , and having a dual nature and function,  $\vec{v}_g, g = (1, 2, \dots, m)$  qualification, and  $\bar{v}$  access:

- $\vec{v}_g$  is a vector which contains the requirements that a AU must have to access the specific CI: e.g., for the Restoration: type, historical period, architectural quality, testimonial value; for each of these requirements is defined a threshold below which the AU does not belong to the CI, respectively: “building”, “prior to 1950”, “medium”, “medium”; the AU may not meet all requirements;
- $\bar{v}$  is the minimum number of requirements that must be met for the AU to access the CI.

The generic AU accesses a specific CI if the following is true:

$$IC \leftrightarrow \exists i_1, \dots, i_k (k \leq t, t \leq 1) \mid b_{ij} \geq v_{ij} \forall j = 1, \dots, k \quad (1)$$

Where  $\bar{v}_{ij}$  represents the threshold of the  $j$ th criterion,  $k$  is the number of criteria by means of which  $\bar{v}_{ij} \geq t_{ij}$  is verified,  $t$  is the minimum threshold and  $G_m$  is the CI sorting.

It is possible that the AU meets the requirements to belong to more CI: in this case prevails the highest CI in the  $G_m$  order in the list, on top of which come the conservative or transformative CI depending on the overall approach outlined by the decision maker.

Accordingly, a strategy is defined by the combination of the system of constraints that, gradually allow each AU to access the specific CI.

By variously composing the assortment of constraints, it is possible to give rise to a multiplicity of strategies each of which characterized by a different profile, defined in terms of the degree of compliance to four axiological matrices: landscaping, identity, functional, economic.

## 4. DISCUSSION. USE AND SENSE OF THE MODEL

The unification of the rules for the assignment of CIs (regardless of the program objectives) legitimizes the plan in terms of transparency (Elgert, 2018) and equity, making it suitable for the management of equalizing and compensatory processes, to which the economic valuation is based.

The comparison of the strategies formed by progressively releasing the constraints provides information about the overall structure of each alternative:

- in quantitative terms:
  - physical, i.e. as for the cubage increase when a transformative IS is considered,
  - monetary, i.e. as for the profitability in terms of surplus of real estate market value increase over the renovation cost;
- qualitative, i.e. as for the surplus of the overall value from the technological and morphological perspectives.

It is also appropriate underlining how the two areas of analysis and evaluation, starting from the standardized



characterization of the AUs, fall within the linguistic framework previously exposed, according to:

- the area of the “economic-estimative semiotics” (Rizzo, 1999, chap. 15) in which an AU is a synthesis of “object-characteristics/value”, as well as in linguistics the sign is a synthesis of “referent-signifier/meaning”; here:
  - in the analysis stage the AU works as a “reference”, described mainly as regards to its geometric and material component, as a result of the “fact judgment”;
  - in the assessment stage the AU works as a “signifier” according to the value functions that turn attributes into assessments, as a result of the “value judgment”;
  - in the planning stage the AU works as a “signs”, contributing to the reorganization of the urban (con)text, due to the CI attributed as a result of the “merit judgment”;
- the area of the generative-transformational grammar by:
  - contributing to create and keep the “speaker’s competence” unity, consolidated in the creation of the database, generalized by means of the standardization of the lexicon used for describing the AUs;
  - performing the “execution” of this competence, that is generating multiple strategies more or less transformative.

The semiotic and the generative-transformational layers (referable respectively to “order” and “adventure”) are coordinated using the three aforementioned modes of judgement, which are:

- independent in the programming phase, since the attribution of CI does not take into account costs and prices;
- interdependent in the choice of the best strategy, since the economic profitability is considered among the four general criteria of the final MAVT valuation pattern.

In fact, while the attribution of the CI enables the vertical link between signifiers and meanings (characteristics and values), that is the semantic relationship within the sign (the AU), the choice of the strategy enables the horizontal link between the signs. This link is the syntactic relationship characterizing the semantic fields, the textual unit rank to which every urban fabric aspires.

As for the functions of evaluation and project: the planning gesture consists in the exercise of discretioning in the phase of the formation of the rules for the release of the constraints; the evaluation process consists of the definitions of the value functions. This combination of evaluation and project makes the value judgment generally valid *strictu sensu*. The unlimited possibilities of feedback between results and rules make the procedure perfectly circular, coherently with the concept of “revisable truth” (D’Agostini, 2011).

## 5. CONCLUSIONS. FLASH-BACK: DESIGN AS AN ASSESSMENT STAGE. SIGNS, SYMBOLS, ICONS, THE NEW HYERARCHIES OF THE URBAN FABRIC

The axiological approach provides the perspective and the prospect of the whole analysis, evaluation and planning pattern for the building activity aimed at the urban building-fabric revitalization, reversing the traditional unidirectional approach – from data to the project – and allowing the definition of a variety of strategies. It enables the heuristic functions that connect knowledge and transformation coherently with the dialectic between “competence” and “execution” that characterizes the generative-transformational grammar. This dialectic arranges the coordination of the three layers of judgment: fact-oriented (the competence that is represented in knowledge), value-oriented (the critical coordination of factual occurrences through the value functions) and merit-oriented (the execution that generates the strategies).

The circular combination of the three areas of judgment made it possible to experiment the relationship between evaluation and project both in the most traditional sense, “the evaluation as a tool of the project”, and in the most current one, “the project as an evaluation tool”, in a recursive activity that describes the ability to apply a properly described, characterized and identified architectural urban system.

This feedback of the evaluation project was tested by measuring the “resistance” or “condescension” of each UA to move from one CI to another, once a significant number of strategies has been generated.

In this sense, assuming the project as an evaluation tool means exploring the possibilities that an object has to generate new values, thus measuring, its “beyondness” (De Monticelli, 2009).

In this regard, the generation of strategies has allowed the association of each AU with the notions of sign, symbol, and icon, in a “crescendo” of strategic importance in the arrangement of the urban landscape.

The sign is characterized by the conventional, thus hetero-referential, relationship between signifier and significance. While, on the contrary, an icon is a particular sign whose meaning is expressed by itself, hence being self-referential thus influencing the context: an icon stands for itself, while a sign stands for something else. A symbol (Soletti, 1994) is a particular sign that stands for something that transcends it, therefore only in this meaning it can be considered “other”; as such, it can be considered an intermediate entity between sign and icon, neither totally self-referential nor hetero-referential.

The AUs can be classified into signs, symbols, and icons by exploring the qualities of the sample through the generation of strategies. They have been classified according to their ability to maintain, despite the gradual release of the constraints, the original CI, conservative, or

rather to move on to the subsequent, more or less transformative, ones.

This classification correlates characteristics of the AUs and IS, and is therefore the end point of the evaluation process described so far; it legitimizes, therefore, as a topical moment for the articulation of compensatory and equalizing approaches, because: the AU-icon will be the target of projects of public interest, attracting a significant part of the overall economic surplus (revenue-costs) with capital financing and partnership mechanisms with a

predominant public component; the AU-symbol will be the target form of transfer of property rights for which the real estate economic surplus deriving from the assignment of more profitable categories of intervention is intended to finance the implementation of the less profitable ones. At last, the AU-signs will give the possibility to implement highly transformative experimental designs capable of generating surpluses in income and capital value, which can then be extracted for redistributive purposes.

\* Salvatore Giuffrida, Department of Civil Engineering and Architecture, Università degli Studi di Catania  
e-mail: sgiuffri@yahoo.com

## Bibliography

BERARDI U., *Sustainability assessment of urban communities through rating systems*, Environment, Development and Sustainability, Vol. 15, n. 5, 2013, pp. 1573-1591.

BORGES J. L., *La misura della mia speranza*, Adelphi, Milano, 2007.

BOSCARINO S., FEDERICO A., GIUFFRIDA S., PRESCIA R., RIZZO F., *Petralia Soprana. Ipotesi di restauro urbano e studi di analisi multicriteriale*, Medina, Palermo, 1994.

CARTER A., ROBERTS P., *Strategy and Partnership in Urban Regeneration*, Urban Regeneration. 2nd ed [ed.] Roberts, P.; Sykes, H.; Grager, R. Sage, London, 2017, pp. 44-69.

CURTO R., BARRECA A., ROLANDO D., *Restoration, Reuse and Energy retrofit for the enhancement of 20th Century Heritage: a learning experience on the Ivrea Site Inscribed on the UNESCO World Heritage List*, Valori e valutazioni, Vol. 21, 2018, pp. 41-57.

CURTO R., FREGONARA E., *Monitoring and Analysis of the Real Estate Market in a Social Perspective: Results from the Turin's (Italy) Experience*, Sustainability, Vol. 11, 2019, pag. 3150. doi: 10.3390/su11113150

D'AGOSTINI F., *Introduzione alla verità*, Bollati Boringhieri, 2011.

D'AGOSTINI F., *Realismo?*, Bollati Boringhieri, 2013.

DE MONTICELLI R., *La novità di ognuno. Persona e libertà*, Milano Garzanti, 2009.

ELGERT L., *Rating the sustainable city: 'Measurementality', transparency, and unexpected outcomes at the knowledge-policy interface*, Environmental Science & Policy, Vol. 79, 2018, pp. 16-24.

FATTINANZI E., *Valutazione della correlazione tra i costi di costruzione e di manutenzione*, Centro Studi Abitare nell'ambito del Progetto Finalizzato Edilizia. Consiglio Nazionale delle Ricerche, 1992.

FREGONARA E., CORRADO C., PASQUARELLA O., *LCC Analysis to evaluate the economic sustainability of technological sce-*

*narios on the district scale*, Valori e valutazioni, Vol. 21, 2018, pp. 59-73.

GIANNELLI A., GIUFFRIDA S., TROVATO M.R., *Madrid Rio Park. Symbolic Values and Contingent Valuation*, Valori e valutazioni, Vol. 21, 2018, pp. 75-85.

GIUFFRIDA S., FERLUGA G., GAGLIANO F., *Social Housing nei quartieri portuali storici di Siracusa*, Valori e Valutazioni, Vol. 11, 2013, pp. 121-154. ISSN: 2036-2404

GIUFFRIDA S., GAGLIANO F., *Sketching Smart and Fair Cities. WebGIS and Spread Sheets in a Code*, In: Murgante B. et al., (eds.) Computational Science and its Applications - ICCSA 2014, Vol. 8581, pp. 284-289, Chaim (ZG): Springer International Publishing Switzerland. ISBN: 9783319091495, Guimarães, Portugal, Jun. 30-Jul. 3 (2014)

GIUFFRIDA S., VENTURA V., TROVATO M. R., NAPOLI G., *Axiology of the historical city and the cap rate. The case of the old town of Ragusa Superiore*, Valori e valutazioni, Vol. 18, 2017, pp. 41-55.

GOULD K. A., LEWIS T. L., *The environmental injustice of green gentrification*, In The World in Brooklyn: Gentrification, Immigration, and Ethnic Politics in a Global City. De Sena J. and Shortell T. [eds.] Lexington Books: Plymouth, 2012, pp. 113-146.

GWANG H. K., SUNG H. A., KYUNG I. K., *Comparison of construction cost estimating models based on regression analysis, neural networks, and case-based reasoning*, Vol. , Elsevier, 2004, pp. 1235-1242.

HEALEY P., *A strategic approach to sustainable urban regeneration*, Journal of Property Development, Vol. 1, 1997, pp. 105-112.

HEMPHILL L., BERRY J., MCGREAL S., *An indicator-based approach to measuring sustainable urban regeneration performance: part 1, conceptual foundations and methodological framework*, Urban Studies, Vol. 41, n. 4, 2004, pp. 725-755.

KYRKOU D., KARTHAUS R., *Urban sustainability standards: pre-determined checklists or adaptable frameworks?*, Procedia Engineering, Vol. 21, 2011, pp. 204-211.

MORO A., *I confini di Babele. Il cervello e il mistero delle lingue impossibili*, Longanesi, Milano, 2006.

OPPIO A., TORRIERI F., BIANCONI M., *Land Value Capture by Urban Development Agreements: The Case of Lombardy Region (Italy)*, Smart Innovation, Systems and Technologies, Vol. 101, 2019, pp. 346-353.

OPPIO A., TORRIERI F., *Public and private benefits in urban development agreements*, (a cura di) Bisello A. Vettorato D. Laconte P. Costa S., Smart and Sustainable Planning for Cities and Regions. SSPCR 2017. Green Energy and Technology, 2018, pp. 345-356.

OPPIO A., TORRIERI F., DELL'OCA E., *Land value in Urban Development Agreements: Methodological perspectives and operational recommendations*, Valori e Valutazioni, Vol. 21, 2018, pp. 87-95.

RIZZO F., *Valore e Valutazioni. La scienza dell'economia o l'economia della scienza*, FrancoAngeli, Milano, 1999.

SHARIFI A., MURAYAMA A., *Neighborhood sustainability assessment in action: cross evaluation of assessment systems*

*and their cases from the US, the UK, and Japan*, Building and Environment, Vol. 72, 2014, pp. 243-258.

SOLETTI E., *Simbolo*, Beccaria G. L. Dizionario di Linguistica, Piccola Biblioteca Einaudi, 1994.

SULLIVAN L. J., RYDIN Y., BUCHANAN C., *Neighbourhood sustainability frameworks-a literature review*, Centre for Urban Sustainability and Resilience, Working Paper, University College London, 2014.

TROVATO M. R., GIUFFRIDA S., *The choice problem of the urban performances to support the Pachino's redevelopment plan*, Int. J. Business Intelligence and Data Mining, Vol. 9, n. 4, 2014a, pp. 330-355.

TROVATO M. R., GIUFFRIDA S., *A DSS to assess and manage the urban performances in the regeneration plan: The case study of Pachino*, ICCSA 2014, Springer Verlag, Vol. 8581, parte 3, 2014b, pp. 224-239. doi: 10.1007/978-3-319-09150-1\_17

VINEIS E., *Grammatica*, Beccaria G. L. Dizionario di Linguistica, Piccola Biblioteca Einaudi, 1994.