

The overall quality assessment in an Architecture Project

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Abstract

The quality of the works that create settlements and allow their inhabitants to enjoy them is an essential component in determining the life quality level. This is why assessing the quality of a project has become increasingly important in the cultural debate and the regulatory development in Europe. This can be understood as the performance propensity, which considers the functional qualities together with the perceptive and symbolic attributes both of the works to

be accomplished and the interventions to be carried out on the existing heritage. This assessment must be extended to the entire life cycle of the work.

Inspired by this hypothesis, this essay analyses the mental and cultural mechanisms that govern the entire project process, and investigates the nature and impact that the assessment instruments have on this process starting from the formation of the generating idea up to the executive definition of the project.

The aim of this paper is to show how there is a need to fill a substantial theoretical and scientific deficit on the roles that the Evaluation and Assessment is given in the design of works that, albeit with different dimensions and impacts, are designed to change the structure of the physical space of territories and settlements that structure them*. In particular, we refer to projects with some architectural value. For the purposes of this paper, we will not refer to the reasons and events that have led to this deficit. However, we want to criticize how this deficit has heavily conditioned the evaluation and assessment in the teaching of universities¹. Institutions that are assigned with the specific mission of training a category of professionals that, notwithstanding the different roles and placements, is delegated to form,

draft, and implement intervention programs and projects that act on the physical space of cities and territories².

Much has been said and written about the economic values of existing buildings, and at times their functional quality or their symbolic meaning has been theorised but, as has been acutely noted recently in the pages of Values and Evaluations³, the process by which those values and qualities are generated has remained substantially a *black box* within which the specific mental processes that create functioning and control mechanisms stay undefined and mainly unknown.

Recently, however, there have been some events, also in Italy, that have brought to the foreground problems regarding architectural quality and the role that this plays in the project, making us reflect on these issues, and has finally

* The notes included in this text refer to the numerically scarce contributions that in the Italian scientific area have dealt with the architectural design except for those dealing with specific legal and normative aspects. Each document referred to is generally accompanied by an extensive bibliography to which those who want to study further the issues addressed here can refer.

¹ Acampa G., Napoli G., Giuffrida S., (2018) *La disciplina estimativa in Italia, Identità, conoscenza, prospettive*, in Valori e Valutazioni. Teorie ed esperienze, No. 20, DEI, Rome.

² European Directive 2013/55/EU of the European Parliament and of the Council of 20 November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications. Article 46 deals with the Training of the Architect.

³ Bentivegna V., *Qui si parla di progetti, valutazioni e valutatori*, Editoriale, in Valori e Valutazioni, teorie ed esperienze, No. 6, DEI, Rome, 2015.

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defeated intellectual laziness and cultural backwardness. Two of these events have a particular impact. The first is the enactment of an innovative law on public work designs and how they are presented; the second is the spread of legislative activity in Europe that aims to improve the architectural level of the cities, and the introduction of criteria to assess and certify the proposed works.

These events have urged the current chairperson of the Order of Architects of Rome to plan and assess a series of initiatives that study the relationship between the evaluation and design instruments and, if necessary, identify methods to insert the latter in the professional practice of architects concretely.

Intense collaboration between the order and the SIEV – the Italian Evaluation and Assessment Society – in particular with the editorial board of its scientific journal “Valori e Valutazioni teorie ed esperienze” was launched to implement this program. Therefore, this is an occasion for developing the evaluation and assessment subject to fill the current deficit and to create conditions to re-launch the centrality of the subject in the training of architects and engineers. It would thus be possible to reverse the current trend of their progressive marginalisation and subordination in the scientific and educational activities of the faculties designated to train architects.

The work must, therefore, be carried out starting from the opening of the “black box”. This would allow investigating and understanding the phases involved in the formation of the project and specifying the nature of the mental processes that characterise each of these phases. Furthermore, the kind of the resources, time and skills required by the project team must be acknowledged. We believe that this reflection is the necessary reference to understand the role that estimative and evaluative processes should and could play. We also feel that it the opportunity provided by the collaboration with the Order of Architects of Rome is the ideal place to elaborate and discuss the development of the Evaluation and Assessment Science in a field looking at innovating its scientific expertise and operational instruments.

1. THE LEGISLATIVE INNOVATION ON THE DRAFTING AND PRESENTATION OF PUBLIC WORK PROJECTS.

In recent times there has been a need to introduce regulatory innovations in legislation able to deal with (and try to solve) the serious problems that in Italy penalise and distort the Italian situation compared to the European scenario.

An extreme situation in which, in too many cases, the low project quality of the works intertwines and interacts with the spreading of severe illegality and corruption. Numerous cases (which are sporadically reported by major media outlets) in which, together with an abnormal expansion of the building times and costs, there were scandalously insufficient performance levels.

Faced with these phenomena, there was a search for a different set of rules on the implementation of public works, in which, for the first time, importance was given to the quality of the design, which is considered an essential instrument for increasing the performance level of the finished work and for an effective control of the building times and costs⁴.

Such a regulation would reduce and marginalise the insufficient current competence levels and, at the same time, contribute and make more difficult and more evident the phenomena of the conniving submission of directors and professionals to particular interests, even illegitimate ones. In short, it would offer a significant contribution to more effective control of corruption and wrongdoing.

At present, these measures concern only public works contracts, but it should be remembered that the new procedures and methodologies of intervention already find significant correspondence in work done in some of the largest and most dynamic companies operating in the sector. However, the experience both in Italy and in other European countries show how many innovations (both process and product) initially introduced only in the public sector were subsequent and slowly also extended to the private construction sector.

We do not believe that this is the place and the occasion for a careful critical analysis of a regulation that, in many respects, due to its highly innovative character, gradually must be experimented, tested, and developed. Instead, we would like to focus on those aspects that most call into question the intervention of estimation and evaluation procedures, not only as instruments to be explicitly used in designing projects but also to propose implementing rules and criteria that make the envisaged procedures and criteria operational.

Firstly, Article 23 of Legislative Decree 50/2016 and subsequent amendments and additions, introduces an innovation that we consider to be of enormous importance. It establishes that the design of a public work that architects present to the contracting authority must be accompanied by a promptly documented choosing and selection process operated on a pool of possible alternative solutions, and based on systematic assessments and comparisons. Therefore, a process that must be necessarily based on the adoption of an assessment method founded on criteria capable of assessing the level of satisfaction of the performance requirements. These criteria must be theoretically based, transparent, and unconvertible. In any case, since the various alternatives considered must respect the established budget and time limits, instruments capable of operating an effective and transparent control on these

⁴ Campo O., Rocca F., (2017), *La parametrizzazione delle quantità fisiche nella definizione dei costi parametrici. Il Decreto 50/2016 sulla progettazione delle opere pubbliche* in Valori e Valutazioni No. 19, DEI, Rome, pages 3-10.

aspects should be implemented, and must also take into consideration the need for resources that, starting from the further stages of implementation of the work, should be extended to the work's entire life cycle.

We think that the concerns that the new and more complex ways of drafting and presenting projects, exacerbate the costs, times, difficulties, and complexities that the project teams are currently experiencing to be reasonably founded. We believe that the old and new challenges can be faced and overcome only by making substantial innovations to the traditional organisation and instrumentation of project studies. In short, we must remember that the problems that the current world creates can be solved only through a critically aware use of the dominant intellectual and instrumental means that contemporary society makes available. In this perceptive, a decree was introduced to implement paragraph 13, Article 23, the so-called "BIM Decree"⁵ that introduces the Building Information Modelling in the planning, design, building, and management of public works. The adoption of this new important methodological/computer instrument initially requires learning and experimenting. However, it makes the control of the entire process by the architects, contracting authorities, economic operators, and stakeholders easier, faster and cheaper (and more transparent and communicable). It is envisaged that the decree should be applied following a precise timetable, starting from the most significant works and, by 2025, to public works of all sizes.

However, the legislation provides for numerous cases in which the contracting authorities, provided they have met certain preliminary obligations, can immediately use the methods and instruments provided for by the decree even before its entry into force.

Until now, the focus has mainly been given to the ability of BIM to make the complex of relationships between the contracting authority, contracting companies, and all the other contractually involved subjects in creating the work more certain, transparent, and codifiable. Secondly, it has the potential of making the project formation process and, in particular, the relative itemised estimate more transparent and controllable.

⁵ The GIS (Geographic Information System) is another instrument besides the BIM that is not provided for by the Regulation in force, but has already been used by some administrations. This system makes the complex assessments on the inclusion of the work in the urban and territorial context more effective and efficient. Potentially, the instrument would provide greater ability to verify the spatial contextualization of the planned work and provide stratified information on the spatial and environmental data useful to the architect.

Giuffrida S., Ferluga G., Gagliano F. (2013), *Un modello WebGIS per la valutazione e la programmazione*, in Valori e Valutazioni No. 11, DEI, Rome, pages 121-154.

Mattia S., Oppio A., Poletti A., Pandolfi A., (2013), *Il ruolo dei G.I.S. e dell'analisi di scenario per la stima del danno ambientale*, in Valori e Valutazioni No. 10, DEI, Rome, pages 171-184.

We consider this approach to be correct but utterly insufficient. Some experiences, even personal, have shown how complete computerisation of the project with BIM methodologies allows to acquire a considerable amount of information that, appropriately detected, organised, and processed informatically, would allow to integrate the evaluation procedures in the planning decision-making process with a more rapid and punctual control of both the performance and the economic aspects of the works carried out.

While reiterating the need, positivity, and relevance of the recent legislation, of course, its application will pose severe interpretative problems and operational issues, of which the legislature does not seem to realise fully. Problems and critical issues that, if we do not intervene promptly to remove them, adopt timely and effective amendments, and, above all, introduce adequate implementation rules, are destined to reduce the positive potential of the legislation to the limit.

At this time we would like to call attention to some shortcomings and generics relative to the adoption of procedures without criteria based on which to choose from the alternative projects either placed in a pool by the single operator and, above all, among final projects presented by different and, apparently, competing operators. Concerning these aspects, the regulatory framework, at the current state, would generate significant implementation problems and a plethora of disputes that could hinder or entirely block the application of the regulation.

First of all, implementing rules should require that the contracting authorities or the competent administrations define the criteria to be followed in the creation of alternative qualitatively and quantitatively significant projects based on the purpose of the work to be designed. Consequentially, the second list of problems needs to be addressed. To make sufficiently homogenous and, especially, disputable comparisons, a defined set of demands needs to be used to compare and assess the various alternatives considered by the individual architects and, above all, drive and make a choice between the solutions presented by the diverse and competing architects controvertible. Clearly, in the same direction, similar estimate parameters and criteria that show how all projects considered effectively respect the budget limits established by the contracting authority must be defined.

Finally, to avoid problems and disputes as much as possible, the selection of the project must unquestionably emerge from a complex assessment of each of the competing design. The competent administration must establish the strategic priorities that, according to the purposes declared, must be translated into different *criteria categories*.

To identify the modifications and integrations needed to solve its shortcomings and difficulties in interpretation both as regards to the diffusion of the professional and instrumental skills required by its concrete application, this legislation *calls for those branches of estimative and evaluative disciplines that consider the planning, design,*

and implementation of works that transform the physical structure of cities and territories. Historically, this is a disciplinary area that has a theoretical apparatus and a solid experience in applying instruments that allow for convertible, transparent, and highly scientific assessments. Moreover, this discipline has proven to be highly capable of absorbing and integrating the various multidisciplinary contributions required. So, on the one hand, for the new legislation to get off the ground, it needs to use its contribution. On the other hand, it urges the development of its disciplinary identities to overcome the deficit shown in professional and educational activities that characterises much of its presence in the academic and scientific community.

2. THE QUALITY OF THE PROJECT: AN EMERGING PROBLEM

The second order of events that brought to the fore the issues regarding the quality of the architectural project derives from the awareness in many countries of the European Community⁶ that the structure and overall quality of the urban and territorial physical space is a fundamental component of well-being and quality in the life of the communities living in those cities and territories. At the same time, there is an awareness that this level of quality depends on the stratification of all the contributions, of greater or lesser extent, positive or negative that, over time, each of the newly constructed, expanded, transformed, or rebuilt objects have contributed, contributes and will inevitably help to create. Therefore, it is a question of jointly considering the interacting intrinsic qualities, which related to the architectural object and the extrinsic attributes, which concern the collocation of the object in the overall urban and territorial context. In fact, both *intrinsic* and *extrinsic* elements, not only the *practical/functional* functions but also those of a *symbolic/perceptive* nature should be considered.

Any subject, be it public, private or mixed, which intends to promote the implementation of any intervention, always

explicitly or implicitly aims to pursue objectives of a different nature: political, economic, social, cultural. Based on these objectives and, above all, of the priorities assigned to them, it will necessarily establish explicitly, and no longer implicitly⁷, the requirements that must characterise the finished work. Generally, these are practical/functional requirements, but together with this *increasing* (perhaps due to public image, market value, political image, etc.) importance are also given to its insertion in the image and symbolic identity that, historically, characterise the places in which it is placed. To achieve these purposes, the promoter will decide to obtain and invest the resources required. In any case, the level of satisfaction of those needs and the amount and type of resources used, are determined to a significant extent by the particular physical configuration that architects give the work.

Generally, the assessment of the success of the built and performing work will, as a priority, take into consideration the particular balance between its overall performance level and the number of resources used to create the work. This balance defines the result of the design choices and their influence on all phases of the construction process. On the other hand, this balance must increasingly take into consideration the life cycle and, therefore, must assess the resources required for maintenance operations needed to preserve and maintain the initial quality and, the resources necessary for its functioning and management. Moreover, a life cycle that must be measured over a period that, in today's world, given the dominant current European culture, tends to get longer and longer.

Therefore, we believe the position that considers the qualitative outcomes of the interventions on the physical space a question that cannot be exhausted in the relationships between the architect and the client. In any case, limited to the cultural, professional, and economic logic of the individual stakeholders who, in several capacities, intervene in the development of the many intervention processes to be legitimate. Therefore, we believe the fact that the authorities who, at different levels, articulate and govern the European reality (from the European Community as a whole to regional administrative governments) but also qualified intermediate bodies (professional and cultural), are working to activate norms and incentives capable of progressively improving the architectural quality of the implemented interventions in their territories to be understood and shared⁸.

In the EU, numerous countries have for some time developed systems to assess the design quality (*Qualitel* in

⁶ At community level: Davos Declaration 2018 "Towards a high-quality Baukultur for Europe", Ministers of Culture Convention, 20-22 January 2018, Davos, Switzerland; Council conclusions on architecture, 2008, the contribution of culture to sustainable development (2008/C 319/05); Council conclusions of 24 May 2007 on the participation of the cultural and creative sectors to the achievement of the Lisbon objectives (2007/C 311/07); Council Resolution of 12 February 2001 on the architectural quality of the urban and rural environment (2001/C 73/04); 1985, Directive 85/384/EEC, in which it was already declared that the architectural creation and the building quality are of public interest, a principle taken from the different national laws. At the level of individual countries, the most recent laws of France must be highlighted, Law 2016-925 du 7 juillet 2016 relative à la liberté de la création, à l'architecture et au patrimoine e della Comunidad Autónoma de Cataluña, Ley 12/2017, de 6 de julio, de la arquitectura.

⁷ Forte F. (2015), *Implicazioni del metodo scientifico nel rapporto tra processo progettuale e valutazione*, in Fattinanzi E., Mondini G. (a cura di), *L'analisi multicriteri tra valutazione e decisione*, DEL, Rome, Pages 287-300.

⁸ In particular, the law of Catalonia (12-2017) establishes the Council of Architectural and Urban Quality of Catalonia (Article 9) and Consultation Bodies for architectural and urban quality (Article 10).

France, the *ERP*; *SEL* in Switzerland, *Spread* and the *Design Quality Index* in the UK, and *Level(s)* a platform of the European Community, etc.). These allow the design to be subjected to quality certificates (in the UK it was the building industry that adopted this concept). In our country, the *SIVA/Sisco* assessment model was patented and has been widely tested on ERP interventions⁹ (approximately 60 real cases). In Italy, these needs, which were already expressed in other countries, have generated various *draft laws on architecture*¹⁰ and an additional urgency to clarify the requirements of the current procurement code.

3. ASSESSMENT IN THE PROFESSIONAL ACTIVITIES OF ARCHITECTS

After briefly illustrating the main reasons that have further urged the interest on cultural and functional relations between design and evaluation, we propose some issues that allow us to start opening the *black box* which, up to now has hidden the drafting process of the design, so that we can analyse its mechanisms. We believe that it is essential to start from this operation and from the theoretical and operational implications that emerge to being our contemplation of the Evaluation and Assessment area.

4. INTERPRETING THE PROJECT FORMATION PROCESS

We propose to start our consideration from some essential phases that articulate the design phase, and that we will briefly unveil here (to then subsequently study in depth the most important issues).

Firstly, after having taken note of the general aims that led to the decision to create a specific work, and having acquired knowledge of the constraints to comply with and the amount and type of resources to use, the team formulates an overall idea of the physical organisation of the work. This is a preliminary theoretical hypothesis that proposes how the set of practical/functional and perceptive/symbolic requirements needs to be satisfied with works of that type, from the social and economic structure that characterises that territory at that historical moment. The team may consider one hypothesis or can compare alternative theories. In some cases, these can be stimulated by considerations and constraints of various types. For example, they can be dictated by the natural and settlement morphology of the site, by its historical environmental character, by the normative and legal system in force, or

determined by the productive technological structure and/or by the functional and typological customs dominant in that territory.

At this time, to give real consistency to the initial hypothesis, the subsequent design development will assume an essentially analytical character that consists in the decomposition of the possible physical structure for the work to be created as well as in identifying the functionally and perceptually significant components that are considered capable of producing it.

We can reasonably assume that the initial idea is as a spatial and mental framework, in which the architect inserts components that it deems most appropriate. The solutions are generally selected, implicitly or explicitly, from a pool of solutions that, in that situation, are concretely available. These solutions must be assessed based on a series of criteria (on which we will return later). Apparently, one of the most important criteria is that regarding the overall structural congruity with the framework offered by the initially formulated *generating idea*. The adopted solution may be the product of two or more solutions initially considered. In some rare cases shown below, we will see how the solution may present an utterly innovative character.

The representation of the design process proposed here shows the importance that the initial hypothesis plays throughout the final formation of the project. This is why it is effectively referred to as the *generating idea*¹¹.

From the considerations made so far, it is clear that particular solutions and components are added both during the formation of the initial alternative hypotheses relative to the *generating idea* and the selection phase; mainly, in all of its phases, the architectural project is an intellectual activity that is primarily founded on selection, comparison, and evaluation procedures. Therefore, we can make an interpretive thesis according to which the *assessment would be an imminent and pervasive feature that characterises the overall drafting of the design*.

Based on these considerations, we can draw some working hypotheses that we consider useful in the further development of our reasoning.

We will consider the assessment of the design quality of a created work as a unitary expression of the level of appreciation of its overall performance and practical, functional, and symbolic impact on the perception of the work as a whole and the specific perceptive of the individual components adopted as well as the effectiveness of their placement in the final configuration of the work.

We believe that between the qualitative levels of a work

⁹ Fattinanzi E., (2012), *La valutazione della qualità e dei costi nei progetti residenziali*, in Valori e Valutazioni No. 6 and 7, DEI, Rome.

¹⁰ <http://www.versounaleggeperlarchitettura.it/>.

¹¹ Forte F. (2014). *Il processo progettuale nell'approccio di Purini Thermes Architetti: il ruolo della valutazione*, in Valori e Valutazioni, teorie ed esperienze, Vol. 13, DEI, Rome, Pages 37-44.

[and the set of resources used for its construction, maintenance, and management, it is not possible to establish a cause and effect relationship (we cannot say that high quality = high cost or, inversely, low cost = low quality). On the other hand, we reiterate the principle that to assess the actual success of a project, the budget established during planning must be respected and must also be motivated and detailed in the technical and economic feasibility of the design.

We argue that *the adoption of a performance and economic assessment method would give the formation of a design greater awareness and would make it controvertible. However, it would also be increasingly integrated and interactive within all decision-making phases on which the overall implementation of an intervention on the physical space is based, from the planning phase up to its real creation, and to be extended to the maintenance and management phases*¹².

We then believe that the organic and structured use of assessment procedures during the entire implementation process is essential when consulting processes as well as the involvement of institutional and economic stakeholders are systematically added, and when the population becomes involved¹³.

5. ASSESSMENTS IN FORMING DESIGNS THAT CHANGE THE PHYSICAL SPACE

After having declared and submitted to the debate some theses and preliminary assumptions, we now want to offer some insight that we will articulate according to the phases indicated and summarised up to now.

6. THE ASSESSMENT IN THE PHASE PRECEDING THE START OF THE DESIGN PROCESS (EX ANTE)

This is the phase that proceeds to entrust the assignment to the architects (either directly or through a tender). We believe that it is essential for the promoter of the project to

¹² Therefore, the organic inclusion of assessment methods in the entire development of the project plays a decisive role in improving the performance and economic propensity. On this thesis also see: Purini F., introduction to the volume by Fattinanzi E. and Mondini G., (2015), *L'analisi multicriteri tra valutazione e decisione*. DEI, Rome.

¹³ Fattinanzi E., (2013), *Esperienze di partecipazione e coinvolgimento nel Social Housing in Italia*, in Valori e Valutazioni No. 11, DEI, Rome.

In the first part of the volume in Fattinanzi E. and Mondini G., (2015), *L'analisi multicriteri tra valutazione e decisione*. DEI, Rome, we highlight the sections:

Berni M., Oppio A., *L'Analisi* (2015), *Multicriteri a supporto di processi di progettazione e pianificazione partecipati*.

Berni M., (2015), *Partecipazione e analisi multicriteri: la valutazione democratica dei progetti*.

carry out some crucial operations for the success of the planned intervention:

- Clearly and publicly state the objectives that led to the activation of the intervention and the priority given to these objectives;
- Define the resources made available for the implementation;

Translate the purposes and other programmed contents of the intervention into a set of requirements with which the built work must comply.

During this phase, the assessor plays an essential role as a hinge. In fact, having translated the objectives into a transparent, well articulated, and hierarchical system of different requirements that must characterise the project, the assessor confers greater concreteness and incisiveness to the technical and economic feasibility. To be valid and operative, this system must be accompanied by a statement of the criteria that must be respected to clearly and controvertible establish if and how the services offered comply with the requirements.

7. THE ASSESSMENT IN THE DESIGN FORMATION PHASES

After having generally spoken about the intervention process, we can take an in-depth look at the design formation phase. In the overall design formation phase, we need to identify some phases that, moreover, will often take on an interactive character. These phases are the start of the design phase, the formation of the generating idea, and, finally, the development and building of the project.

8. THE START OF THE DESIGN PHASE

In this initial phase, the team acquires the indications dictated by the promoter or contractor and specified in the contract documents. At this time the team will have to incorporate the binding constraints, including regulatory restrictions, on the area of intervention, acquire the objectives, the priorities of the promoter or the contractor as well as the related requirements that will guide the project. As has been said, it would be good practice for the promoter to insert the requirements in the calls for tender and the disciplinary procedures; if there is no indication of these requirements, the team should establish them before starting the actual design phase.

From the operational point of view, the following operations must be carried out:

- The professional composition of the team must be defined and, as part of this, the team must decide on how tasks and responsibilities are to be distributed;
- Preliminarily, acquire an evaluation method, setting the performance system that is considered capable of responding to the set of requirements, to be updated as the project definition proceeds;

- Draft a preliminary project management that is fluid, and that can be adjusted and updated during each project development phase. The project management will be updated downstream from the formulation of the *generating idea* so that its specific characters can be taken into consideration and translated into operational implications and in the forecasting of the use of available resources and of the necessary contributions to be implemented inside and outside the team.

9. THE FORMATION OF THE GENERATING IDEA PHASE

During this phase, the possible *generating ideas* are taken into consideration, and the idea that will preside over the subsequent development of the design is selected.

To try to understand the complex, mysterious, and fascinating mechanisms that characterise this phase underlying the design, we need move from the concept that the overall quality of an architectural design will not be magically defined when configuring the *generating idea* but, on the contrary, it will be gradually created during the overall development of the formation process. Therefore, it also depends, to an extent certainly not negligible, on many individual choices and solutions that will be adopted, in particular from their specific efficacy and from the coherence and organicity that characterise their inclusion in the overall structure of the work. It is worth noting that in this insertion a deep interaction is produced: on the one hand the individual components will contribute to the concrete construction of the project, on the other hand, when they are inserted, they will acquire a complete meaning and qualify the quality potential of the project. A quality that we know stems from the fusion that inevitably occurs in the use of a building built with the perception of the practical/functional and the symbolic/perceptive aspects and image.

We are convinced that the specific aesthetic quality of an architectural object is typical of interactions between first and second functions. Certainly, under the figurative and symbolic profile, it is possible to appreciate the views offered (as when we are in front of a sculpture) by a useful volumetric composition of a building or be delighted (like when we see a painting) the geometric and material structure of its bi-dimensional elements. However, we believe that the quality of architecture is something different and more complex. The single user or a community of users fully appreciate a constructed space only by using it its practical use, since they involve a series of perceptions with an ever-dynamic character, in which practical and functional aims merge with the visual and symbolic impressions. A fusion that, naturally, can assume different equilibriums, depending on the actual dimension, spatial organization, and intended use of the spaces being used and on the subjective methods and intentionality of those who benefit from it.

In this regard it should be noted how the formation of the

design quality (in particular, but not exclusively, in the bearers of architectural value¹⁴) cannot in any way underestimate the decisive function performed by intuitive components, a feature that is generated by the mental processes of an inherently subjective nature. In this regard, we point out that contemporary epistemology, in the development of scientific activities, assigns to the formulation of a *theoretical hypothesis a fundamental and founding role*; a role that, due to its nature, will have an intuitive generation and, thus, will be the result of a highly subjective mental process. Currently, the validity given to scientific research no longer resides in its presumed objectivity that presupposes an impossible cancellation of the researcher's subjectivity. On the contrary, modern epistemology demands, as a scientifically qualifying aspect "the unmasking of subjectivity". It presupposes the conscious declaration of the particular subjective reasons that underlie the generation of those intuitions. These reasons are rooted in the specific experience of those who have formulated them, in the professional knowledge and experience they have accumulated and in the ideological components and the cultural baggage that underlie them¹⁵.

We know that during the formulation, a theoretical hypothesis will always present itself in the indefinite and confused form. It will be defined subsequently, in a period that is sometimes very long, based on conceptual developments and empirical evidence. The scientific validity of the theoretical hypothesis must be established through a process conducted based on strict importance, pertinence, and consequentiality. This development must also contain elements and reasoning that allow for forgery, and that stimulate debate within the research team and the other realities involved and, based on relevant criticism, provide for further development or, at most, its overcoming.

As can be seen, modern methods that characterise scientific

¹⁴ The assessment of the quality of work designs that, to some extent, affect the physical structure of the territory is expressed in the estimate of the performance and cost propensity. Generally, the performance propensity has to do with the practical and functional qualities (primary functions) and perceptive symbolic qualities (secondary functions). When we speak of works of architectural interests, we mean those works in which the secondary functions play a significant role.

Forte F (2012). *Il valore architettonico di un immobile: criterio e/o obiettivo?*, in Valori e Valutazioni, teorie ed esperienze, Volume 8, DEI, Rome, pages 105-117; Forte F, *Economia urbana e valori architettonici: il caso Bilbao*, in the SIEV Journal, No. 2, Dei, Roma, 2009b, pages 33-44.

Forte F., Fusco Girard L., (2009), *Creativity and new architectural assets: The complex value of beauty*, International Journal of Sustainable Development, Volume 12, Issue 2-4, April 2009, Pages 160-191.

¹⁵ Fattinanzi E., (2010), *Scienza e valutazione del progetto*, in Valori e Valutazioni No. 4, DEI, Rome.

Fattinanzi E., Rosati P., Manfreda S., (1982), *Introduzione a progetti di edilizia residenziale. La riqualificazione Urbana*, DEI, Rome.

research allow us to identify significant homogeneities with a design formation process that is supported by decision-making mechanisms founded on the adoption of assessment mechanisms.

The *generating idea* (that is initially and inevitably presented as confused and schematic) can be regarded as a *theoretical hypothesis* that configures the spatial structures, and once these are created, the set of objectives that prompted the creation of the work can be pursued. In the *generating idea*, the subjective aspect is especially highlighted and echoes its rooting in the experience of the project team members, the professional and cultural heritage accumulated by the same throughout time, and, along these lines, their legitimate beliefs and ideological convictions.

Accordingly, the *generating idea*, which is initially theoretical, is gradually clarified, defined, and acquires physical concreteness during the drafting process. In this way, and by using explicit assessment criteria in the introduction and method (therefore, controvertible and falsifiable), the initial theoretical hypothesis is verified and, above all, based on relevance, coherence, and pertinence, it is validated. As can be seen, they are the same criteria that give validity to a scientific theory.

Clearly, there is a fundamental difference between the two processes. Scientific research deals with knowing some aspect, until then unknown, of a reality that pre-exists in the experience of the research team. On the other hand, during its drafting, the project team acquires the progressive knowledge of a possible object and investigates the technical and productive conditions that will translate it into a real object. A process destined to insert the designed object into the real world modifying, to some extent, the physical and functional order as well as its symbolic and perceptive characteristics. Many experiences confirm that the drafting of a project can be a cognitive process not only of the designed object but also of the reality because it is involved in the dynamics of a transformation process that precisely because important, original and, at times, unexpected aspects are included in the dynamics of the transformation process¹⁶.

Certainly, the assessments made during the drafting of a project necessarily have a provisional feature. The economic (*economic propensity*) and qualitative (*performance propensity*) results are speculated, but the validity of the choices made can be effectively confirmed only with the completion of the works and, above all, during its use. However, we must take into consideration that fact that the programming and creation of a work are not complicated but also long as well as full of risks and unexpected events. The Sciences of Evaluation and Assessment provide instruments that can identify and measure the impact of these factors. Nevertheless, this

strong unpredictability does not only impact the realisation process but may also modify the intended use. The onset of these phenomena suggest a consequent change to the nature of the architectural project, especially its *generating ideas*, which must have an innovative and inherently dynamic character to ensure the preservation, or at most, improve its fundamental qualifying characteristics, also in the changes that the actual reality of the physical transformations of the space imposes, with increasing probability.

10. THE PROJECT DEVELOPMENT PHASE

The phase during which the *generating idea* was adopted, and that has an eminently synthetic and intuitive character if followed by the design development phase, a stage that has a predominantly logical and rational nature, in which the typical and technological solutions of the various components intended for the construction of the project are selected.

Essentially this phase is identifying with the selection, assessment, and choice of the solutions contained in the pool created that are available in that territory or specific historical period. Thus, in this phase, *architectural work* is primarily presented as a *composition of known and historically determined solutions*.

Similar to the vast majority of all formally certified patents, we can see how the generating idea that inspired an *architectural project is innovative when it constitutes a new way of arranging known and tested solutions and components*. In the history of architecture, we can see that the elevated novelty of the generating idea can give a new and different sense to even the more traditional components. Sometimes, the high innovation of the overall system of a work means that it was not possible to find satisfactory solutions in the available repertoires. This is when the architect is stimulated to *invent completely innovative solutions*. However, it is worth repeating that, especially in these cases, innovative solutions cannot be assessed only in their specific performance but, distinctively, in the interaction between the work as a whole and its components, in the contribution that the originality of the work brings to the overall quality as well as to its most innovative aspects.

The pool of available components in a given framework can be more or less formalised up to the creation of real *referenced repertoires (abacus)*, or list of solutions appropriately ordered and accompanied by information related to both the services they can offer and the resources that their use implies, perhaps by extending these aspects to the expected life cycle of the work. Repertoires that can be appropriately integrated with the insertion, by all the members of the design team, of the solutions or information that their precious personal experiences can propose.

With the solutions adopted and relative performance and economic aspects, it is in this phase that the extenders set

¹⁶ Mondini G., (2009), *La valutazione come processo di produzione di conoscenza per il progetto*, in the SIEV Journal – Valori e Valutazioni – No. 3, year II, DEI, Rome.

the level of the response of their project to the overall requirements that the promoter or team previously established.

In this phase, as the stratification and composition of the solutions are produced, the focus and progressive development of the *generating idea* is determined and, above all, the actual validity and, ultimately, its feasibility are verified. Therefore, at this point of advanced design development, the team could question the overall adequacy of the project idea and the need to introduce changes, up to accepting the need to produce an alternative *generating idea*. We have noticed that, however, the new design will be subjected to inevitable memory mechanisms for which, often, elements of the previous idea, the same pre-selected components and inserted in the preceding plan, will generally re-emerge and, endowed with unprecedented potential and performance characteristics, will find a place, often not marginal, in the new idea put in place.

11. THE FUNCTION OF THE COMPONENTS IN THE DESIGN CONCEPTION PROCESSES

We know that in creative intellectual activities, especially in mental prefiguration processes such as those that characterize architectural design, the mechanisms of memory take on great importance. From this point of view, every manifestation of human thought can be conceived as the result of the continuous growth of connections and combination of knowledge and experience. The conception according to which creativity is configured as the ability to compare previously acquired experiences [it does not matter if these are personal experiences or experiences acquired by others] and to associate and combine them to find convincing answers to the many and various questions that arise in the drafting process is convincing. In other words, we can reasonably note how the creative intelligence of the designer consists primarily in the ability to review his or her knowledge [that we can consider being placed in an archive] and to assess it, associate it and combine it, and finally, allocate this knowledge in a structured hypothesis able to solve the problems, the solution of which is entrusted to the creation of the project to be designed. *A work that will be built by adopting the set of solutions considered more effective than those that, in that historical period and in that specific territory, are concretely available. We can affirm that the ability of a team to effectively develop a project stems mostly from the critical acquisition of past design experiences that, incorporated into the professionalism of its members, can be used to go beyond.*

Some research in psychology has studied and focused on the role that memory plays in the processing of thought and, in particular, in creative processes. According to these studies, images are mentally acquired and stored as information and used in the formation of opinion. For this paper, we are interested in the fact that *generally the mind stores undefined images, (in short, as a kind of album that*

collects clear photographs). Images are not stored as small fragments (elementary volumes, polygons, lines or angles) as more complex elements or pieces; that is, as geometric shapes or volumes, but as elements that can be combined: we do not limit ourselves to re- evoke already seen images but items that can be connected together to prefigure unpublished images. Therefore, as in other creative activities, even in the design conception processes, the designer's mind is a sort of assembly centre, where the mentally acquired elements are composed together, as semi-finished products, to realize and qualify the generating idea, the initial design hypothesis.

At this point, we need to ask how and with what instruments can this process be promoted to make it more effective and efficient.

Experience confirms that it is not so much the volume of the information available that generates new ideas, but it is the organisation of the ideas for a purpose that identifies virgin spaces and directions of development that stimulates the invention and, therefore, the creation of new objects. It is, therefore, no coincidence that, for example, the most interesting residential projects of recent times present typological research based on innovative combinations of different solutions, traditionally considered distant. The mechanism of decomposing and recomposing these "objects" allows designers to use memories, knowledge, and ideas of that share of historically inherited solutions that are incorporated into their disciplinary baggage and thus verify the infinite combinations possible for new individuals.

For this reason, we reaffirm that the success of this selection and selection process is strictly linked to the quantity, quality, and organization of the recorded information and, above all, the ability to make mental references that can be associated with the various practical and symbolic problems that arise in the development of the entire design process.

Ultimately, the creative identity of the designers seems to derive above all from the availability of repertoires of solutions, personal or otherwise acquired, subjectively selected, ordered and evaluated according to systematic criteria and, finally, used to configure effective and relevant design solutions. If we accept this interpretation of design practice we will have to agree that the success of the composite process initiated and outlined with the formulation of the generating idea will be all the more "probable" since the repertoires of possible components available to the project team will be articulated, rich in alternatives and, above all, sufficiently referenced, or rather, accompanied by information on the performance levels offered. However, also supported by the economic and productive implications connected to their most effective use; consequences that we will now have to extend to the entire life cycle of the work. In this regard, we want to underline how the designer of works (not always consciously) performs the same steps that, under a general methodological profile, characterise modern scientific methodologies: analysis of the cognitive problem, its

decomposition, comparison with previous memories, mental reconstruction of possible solutions, assessment of the same, and the formulation of the resolutive hypotheses.

Once the solution of a component is selected and, reconfirmed, it is finally inserted into a spatial structure representing the generating idea and establishing a strong functional and semantic interaction with the entire work and transfigures from building components to architectural detail.

A final consideration of the insertion of components into an architectural project must be made. The interactions between the individual components and the overall work are not limited to the performance aspects but also have to do with its economic, construction, and management connotations and conditioning. Firstly, the morphological and typological elements that inspired the same generating idea strongly influence its parametric values, or rather, the quantitative incidence of the individual components on the “useful result” of the work. On the other hand, the technological solutions adopted to define the element and how it is inserted in the work will determine, in the same way, strongly differentiated building and maintenance costs (total cost).

12. THE ASSESSMENT OF THE COMPONENTS TO BE USED IN THE CREATION OF A PROJECT

It is useful to summarise the concrete articulation of the assessment approach that presides over the selection and choosing of the components in the overall project decision-making process. Each of the choices is made by assessing the various aspects simultaneously. In particular, it is necessary:

- Assess their specific quality and adequacy, or rather, their ability to meet the technical and economic requirements and problems directly related to that particular component;
- Assess, especially in the initial phases of the design process, their ability to contribute to the concretisation of the *generating idea* and a first verification. On the other hand, if the selection is placed in a phase in which the idea has already been sufficiently prefigured and confirmed, the individual solutions will contribute to the validation of its qualitative adequacy and/or the overall technical and economic feasibility;

- In particular, it is necessary to verify the level of congruity with the choices already made and to suggest the influences exercised on those that will have to be applied in the subsequent development of the process;
- Assess the ability of the individual choices to contribute to the pursuit of the overall purposes that stimulated the intervention and drafting of the design, and estimate its congruity and sustainability with the total consumption of the amount and type of resources this involves.

13. SOME CLOSING REMARKS

The complexity of the design process described so far requires that after the formation of the generating idea the team draws up an overall picture in which the choices to be made are arranged in a hierarchical structure, and the functional and procedural priorities are established. This framework must necessarily be dynamic and flexible, allowing it to be adopted following developments in the design process. It is a question about establishing:

- The intervention contents, nature, and times of the members of the project team,
- The contents, times, and the possible phases in which to maintain the relationships that are required as necessary and the possible involvement of external subjects judged functionally essential or opportune.

We believe that drafting dynamic project management as mentioned above can satisfy these needs.

Finally, we would like to draw attention to some of the potentials that are strictly connected to the adoption of evaluation components in the design methods.

First of all, the expression of the generating idea in the formation process and, in this context, the clarification of the criteria, which was adopted following the generating idea, for the selection, assessment, and choice of alternative solutions make the design process more fluid and quick and reduce the conflicts that are often created within the design team that is increasingly numerous and disciplinary differentiated.

We want to reiterate that the adoption of these criteria explicitly motivates the promoter or the tender selection board's choices that have configured and driven the project presented and help make the relative judgment more justified and transparent.

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