

# Debate on the Presence/Absence of the Vitruvian Triad in the Current Architecture and Urban Design

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## ABSTRACT

In a context of general resignation of the Vitruvian triad in architecture and urban design we try to uncover and debate on the current act of building not rationally led but driven by on the spot decisions and subjective needs. Since Soundness, Utility and Beauty have been mainly considered the ideal combination that can lead to the creation of symbols and not simple constructions satisfying stringent needs, the main aim of this study is to highlight the importance of the Vitruvian triad in urban architecture and design, as well as the effects of changing shares of one of the dimensions on the aesthetics and functioning of the buildings. We start from the identification of the optimal combination of all three dimensions Soundness, Utility and Beauty reflected in the worldwide architectural heritage. However, our approach lies between illustrating the dissolution of the triad and identifying its reasoning, emphasizing on the most visible triggered effects in practice. Architecture represents the cultural field whose progress is most visible in time, and whose representatives are the universal symbols of ideas, knowledge and art, as the work of man surrounded by nature. In the end, we advocate for maintaining the presence of the Vitruvian triad for its purpose of fulfilling the role of architecture which is to create humanized environments that would fulfil the need for living still considering creative aesthetics as indispensable supplementary need.

## 1. INTRODUCTION

Looking around us we realize even more strongly that we live in towns and villages that soon shall have no personality. Past footprints have gradually begun to fade and novelty in architecture turned back to basics and lacks in style. It seems like mimicry, unable to arouse interest, curiosity or excitement. We are surrounded by dull houses, buildings and architectural assemblies, designed and executed by the dozen that seem to fill in some gaps and respond to urgent needs of that moment. But is the human need only for construction and housing and to have a roof over the head? We think not, and this has been shown in historical time when civilizations and communities with far less technical means and materials created works of art in the terms of architecture and urbanism that

turned into monuments that today we adore and admire. These symbols of the past have come today to give personality to cities against the new architecture that soon becomes routine. What would be the cause of this situation? The cause is simple - indifference to the value - but with multiple connotations: i) first, contemporary society does no longer have any aspirations and motivations strong enough to create artwork in constructions, everything coming down to necessity, which is also reflected in architecture and urbanism (choosing simple architectural solutions without any style); ii) efficiency and economic viability are the main coordinates for all human actions - which leaves no room for beauty, aesthetics, artistry, poetics in architecture and urbanism; iii) disappearance of valuable architects and planners that would be able to harmoniously combine the three basic Vitruvian

dimensions; iv) leaving out the Vitruvian dimensions in architecture and urbanism, the contemporary society adopting rather a mimetic position than discovering itself and its values. All these connotations of the primary cause are even more reflected in habitat quality and personality – cities becoming simple residential areas, not being able to declare them as the expression of human culture and civilization. What to do? Aside from the fact that it's time we wake up from collective indifference it is even more necessary to rediscover the Vitruvian features in architecture and urbanism and find expression for the artistic creation.

## 2. THEORY AND METHODOLOGY

Architecture plays an important role in the urban landscape, both through aspect and structure, influenced by the socioeconomic context and also by influencing the human behaviour and functionality of the inhabited urban area. At the same time, architectural patterns have developed in time due to the various ideologies and timeframes, always passing from old to new but regulated by guidelines like: aesthetics, space, cost-efficiency, economic crisis, functionality, rationality, and others. No matter the scale or time period, the main qualities of the building (beauty, functionality and durability) have always been taken into account, eventually opting either to incorporate them all or just to a certain extent.

Our approach focuses on the several aspects of architecture, with certain limitations, mainly based on perception and not from the viewpoint of architectural professionals and practice. However, the results consist in revealing the major first-hand factors and effects perceived as influential in the current urban design and architectural-related future choices in the context of urban sustainable development. First, we try to clarify the significance of the Vitruvian triad (soundness, utility and beauty) and its employment in the urban architecture during time, and the shapes it has taken since, as Rabun Taylor (2003) stated, it has never been *not immune to taste and cultural change* [1, p. 22].

Then our perspective is framed by perception, understanding and acknowledging the importance of architecture in the urban identity and order despite the accelerated growth, both economically and demographically. Literature abounds in debates on architecture related aspects, certain specialists paying tribute to Vitruvius and its *De architectura* while others diminish or argue on the role of the fundamental architectural dimensions in the contemporary architecture, like Jeremy Till (2007) considering the Vitruvian triad as simplistic, but a pervasive call for coherence, whereas its components background beginnings rather than the foreground ends [4, p. 120-121]. Much of the contemporary urban architecture has been dictated by the evolution of the urban areas

modelled by several driving forces mainly influenced by the great population movement from rural to urban areas. This has led to major transformations especially at the periphery of the urban areas eventually missing sustainability and management. Even though the sustainability of Richard Rogers (2008) should become the guiding principle of modern urban design the reality of new cities, built rapidly and highly dense, due to agglomeration of incoming population reveal little thought for future environmental or social impact [2, p. 5-7]. Due to the reckless urban sprawl we also perceive the lost of significance of the terms of building and dwelling, Gunter A. Dittmar (2000) concluding that ultimately the building itself has been reduced to engineering and construction, whereas dwelling has been replaced by dwellings and buildings as inhabitable, functional shelters [3]. In the end, we should also consider the contemporary globalized conditions, technology and sustainability concerns brought to attention by Sirowy, Beata (2010), who explained how they to some extent unsettle the previous ways of thinking about architecture and debated on the diagrammatization of architectural theory [20].

### 2.1. Vitruvian triad revisited

Any debate on architecture, architectural expression, urban design or urban development has almost always been based on the Vitruvian triad and its three symmetrically proportioned major dimensions, named differently along the years as features, conditions, properties, qualities or even demands: *firmitas, utilitas, venustas* (Vitruvius, *De Architectura*) or *firmness, commodity, delight* (Henry Wotton, 1624, p. 201) or *strength, utility and beauty* (Joseph Gwilt, 1826), *durability, convenience and beauty* (Morris Hickey Morgan, 1914), *soundness, utility and attractiveness* (Rowland and Howe, 1999) [7] or *strength, function and beauty* (Eric Inman Daum, 2009). Starting from the initial Vitruvian definition of *firmitas* as *mass and solidity crafted to endure eternally*, we got the sense of permanence which laid over years as a grounding definition for the term's evolution into contemporary usage [9]. *Firmitas* represents the static feature of a building, related to resistance to the action of gravity and other physical forces (force by resonance, shear strength, elasticity and others) as well as environmental factors (temperature, wind, humidity) [10, pp. 9-12]. The architectural expression of this attribute is determined by the type of construction materials used (stone, brick, wood, concrete, steel, etc.), the configuration of the resistance structure of a building and the visibility of this structure in its architecture [10, pp. 9-12]. This was the first of the Vitruvian features established and enhanced by man in the history of human civilization, starting from the Stone Age. Today we are the witnesses of a number of

artefacts from that period such as: the assembly of Stonehenge in the UK or the megalithic fortress Sacsayhuaman near the Peruvian city Cuzco in South America. Compared to other dimensions of this triad, this is the only one that cannot be substituted or removed from the wholeness of a building because it would lead to collapse, determined by its own weight or other forces mentioned. Due to its indispensability this dimension has experienced a long process of adaptation and transformation in accordance with construction requirements and the evolution of construction materials and social needs (needs for shelter, advocacy, defence, manufacturing, warehousing, etc.). Hence, the second dimension – *utilitas* - was developed, too.

*Utilitas* is the special dimension representing the adaptation of construction to the purpose and functionality for which it was designed. Purpose and functionality of a building derive from the basic and secondary human needs. Once with the increasing of these needs this feature has been developed as well, currently being found in a variety of types. If the first part of the history of human civilization is dominated by the *firmitas* dimension dictated by the type of building materials or type of representation (the archaic, the Gothic) imposing the features of *firmitas* dimension (e.g. civil engineering in ancient Rome, sumptuous on the outside yet with reduced functionality inside) in the modern and contemporary period once with the diversification of building materials and in particular the extensive use of reinforced concrete, steel, glass, aluminium, the *utilitas* dimension has become dominant, imposing the adaptation of *firmitas* to its requirements. Thus the interior spaces of the buildings have become bulky, for multipurpose use and adjusted for housing and needs of manufacturing, storage, provision of public services, leisure and recreation.

*Venustas* expresses the aesthetic, artistic, symbolic and poetic architectural dimension having the role of decoration, beautification and personalization of a construction or building. *Venustas* dimension can result either from the association and expression of the other two dimensions (*firmitas* and *utilitas*) or can stand as a complementary individual feature expressing through proportions, ornaments, facade, and colour. Thus, *venustas* can be equated with art and symbolism together, since the artistic feature of a work lies not only in its physical reality, but primarily in the meanings expressed by form.

Starting from the ancient times and ending with the modern and contemporary period, *Venustas* dimension has known a variety of forms of expression, eventually all transformed into architectural styles. The expressiveness of architectural forms is determined both by their absolute reality (geometry, texture, and colour) and by the meanings they explicitly convey. It ultimately depends on how they are perceived by the observer, according to the associations or connections they determine.

## 2.2. Representative architectural patterns

The permanent adaptation of the Vitruvian architectural triad over time has led to the structuring of several architectural representative patterns (models), acknowledged and validated as archetypes that have represented inspiration for the schools of architecture and urban design and their representatives. These archetypes have shaped and stylized architectural conceptions leading to the emergence of architectural styles and beautification of urban habitat. When approaching the three basic dimensions of architecture in order to reveal the most representative patterns developed in time, we used the synthetic analysis made by Mihaela Criticos (2007) in her course on Architectural Language. Considering her focused classifications, we tried to highlight the most representative examples as to eventually reveal the main reasons for the dissolution of the Vitruvian triad, mainly present in the residential areas.

*Firmitas* dimension was the first that went through transformations and successive adjustments in time, as proved by Pierre von Meiss (2012) so that we currently find it enhanced and shaped due to the actions and proposals of the active specialists in the field. We note the most visible trends in modelling architectural soundness emphasizing on: *technological integration* in which art and technique are in perfect balance and whose promoter is Frank Lloyd Wright (see fig. 1); *excitement*, in which technique is emphasized and represents the main means of architectural expression and whose promoter is Pier Luigi Nervi (see fig. 2); *figuration*, in which technique is considered not only a sophisticated technical image but also a metaphor overlapping structural reality (see fig. 3); *dissimulation*, in which technique is hidden under other technique due to multiple reasons in which a reference image (prestige) is needed. The representative of this trend in architecture is Andrea Palladio (see fig. 5); *subordination*, in which technique is subject to a prevailing artistic expression and whose core representative is Charles-Édouard Jeanneret-Gris, known as Le Corbusier (see fig. 5) [10, p. 12].

Throughout the history of architecture, *utility* has always sought its place and corresponding proportion within the triad. In the end, as James F. O'Gorman (1998) stated, architecture starts with utility, with the need, and this need should be fulfilled by the building through the form given by the architect and the builder [19, p. 17]. Utility is determined both by the type and the quality of construction materials used and the technical and architectural solutions available. Ever since the modern and contemporary period this dimension has started to become dominant in the triad resulting from two major perspectives: *practical functionality* (volume, space, material, use, quantity) and *idealistic functionality* (comfort, significance, symbol, quality) [10, p. 12].



Fig. 1. Frank Lloyd Wright - one of his architectural artworks – personal house [21].



Fig. 4. Villa Capra (“La Rotonda”) Vicenza, Italia [24].



Fig. 2. St. Mary's cathedral, San Francisco, USA [22].



Fig. 5. Notre Dam Cathedral, Ronchamp, France [25].



Fig. 3. Burj al Arab Hotel in Dubai – high-tech architecture in tourism [23].



Fig. 6. Marriot Marquis Hotel, Atlanta, SUA [26].

Then, all of the perspectives on the functionality in architecture derive from the changing of perspectives and needs and perception, challenges of the new and the musts of the urban development.

*Practical functionality* relates to compliance of space and volume conditioned by the function of the building, and defines the relationship between the interior spaces of the building (volume, distribution, functional design of the construction). Practical functionality is tailored to each category of constructions and it is the fundamental premise for their long-term operation. Incorrect thinking and design of interior spaces and volumes of a building quickly lead to inefficient exploitation. From this perspective, practical functionality represents the quantitative, quantifiable and measurable approach for an architectural project, possible to be predicted and adjusted according to the needs of the activities to be carried out within it. Practical functionality can also be associated and perceived through rationalism – at the beginning of the 20<sup>th</sup> century (Bauhaus and Le Corbusier).

*Aesthetic functionality* is related to the smooth adaptation of the building to its function. It transcends beyond measurable and quantifiable components, implying the creation of architectural personality starting from the identification and imposing of architectural proportions to the optimization of the collective or individual mental comfort. In this case, the psychological and symbolic features are particularized. The psychological dimension expresses the type of environment created by the building both inside and outside, enhance the perception of the architectural framework, the level of comfort offered by space, without which the individuals can act but cannot identify themselves with the inhabited space. Psychological comfort of a building means intimacy, warmth, luxury, customization, environment and security. The best examples are the hotels designed by the architect John Portman, offering a special, spectacular ambience, uniqueness, and sometimes deceiving senses, providing a continuous animation. This environment created by combining luxury with comfort and security attracts a huge number of tourists, the architect John Portman being the designer of one of the most famous hotel chains in the world - Marriot Marquis in Atlanta, USA, and of the famous hotel Burj al Arab in Dubai (see fig. 6).

The symbolic dimension expresses meanings related to destination of building and is interrelated with the individual, group or universal aspirations and values. Thus, symbolic functionality is architecturally materialized through various meanings: functional, social, cultural, ideological and symbolist [10, pp. 12-14].

Functional meaning mainly refers to iconic signs. Both spatially and in terms of volume, the primary and secondary functions of the building are

highlighted by scale and proportion and by using a specific architectural approach. For example, in the case of factories and plants, pipelines and chimneys express industrial functionality (see fig. 7). Social meaning refers to iconic or symbolic signs indicating a certain social or group status. Most significant in this respect are the headquarters of large transnational corporations that convey the social significance and financial strength through architectural greatness (see fig. 8). Cultural meaning is about iconic or symbolic signs expressing the cultural identity of a group or a place. The most striking example is the traditional architecture of places that bears a strong sense of cultural identity. Thus is the example of the traditional architecture in Maramureş region, Romania, based on the use of wood, which expresses a strong cultural significance of the territory it represents (see fig. 9). Ideological meaning refers to the symbolic signs related to the expression of totalitarian regimes or socio-political groups. Some of the most representative examples are the neoclassicism as architecture of revolutions and bourgeois regimes, or the classicism of authoritarian regimes (Nazism, fascism, Stalinism, communism) (see fig. 10). Symbolic meaning refers to a series of symbolic architectural signs holding a certain level of semantic ambiguity and leaving themselves open to many interpretations. It is represented by a spectacular architecture, a mixture of high-tech and other styles that transmit multiple messages and it usually appears as the representative building of a city, which is often linked to an urban event (see fig. 11).

Venustas dimension can take multiple and transient forms in architecture, which can be grouped into two broad categories: *structural and functional forms* and *ideal forms* [10, pp. 22-25].

a). *Structural and functional forms* are derived from structure and function and get to receive aesthetic interpretation and appear/look ornamental being a direct consequence of the combination of the other two Vitruvian dimensions: *firmitas* and *utilitas*. The best example in this case is the architecture of Paolo Portoghesi, who belongs to the architectural classical trend, expressing the natural dynamism, resulted from the dialogue between earth activity, tectonic movement and rain work.

b). *Ideal forms* that are derived from the interpretation of aesthetic and/or symbolic patterns. They imply the existence of a great variety of forms starting from the natural patterns and ending with of those derived from abstract geometry and explicit aesthetic adjustments.

Therefore, venustas dimension can be found under several shapes and forms of manifestations such as: the cosmic model, the mythical pattern, the historical pattern, and geometrical shapes.

*The cosmic model (imago mundi)* reveals the way in which the individual or the community adapt their perception on the cosmic form in architecture.





Fig. 7. Industrial plant, Chile [27].



Fig. 10. Palace of the parliament, Bucharest, Romania [29].



Fig. 8. ING headquarters in Amsterdam, the Netherlands [28].



Fig. 11. The Olympic Stadium Bird's Nest, Beijing, China [30].



Fig. 9. Traditional wood architecture in Maramureș region. Bârsana monastery, Romania.



Fig. 12. Politeama Theatre in Catanzaro, Italy [31].



This type of form was first adapted and adopted in the architecture and it has been present in almost all human cultures and ages starting from the Stone Age to the renaissance period. In this case the design of settlements, housing and sanctuary used to imitate the perception of the cosmic order (imaginary or real). The best examples are the architecture of the Egyptian, Greek and Roman temples (the ancient age), or even the religious establishments in the Renaissance period (the church that symbolizes the ship of the Christian world, the cross, the symbol of axes and the dome as symbol of heaven).

The *archetypal or mythic patterns* are related to the takeover of symbols related to mysticism and include them in the architectural design. The most common archetypal forms transformed into architectural forms through mysticism are: the sacred mountain (pyramids), the labyrinth (symbol of initiation and knowledge and it is mainly used in the design of summer gardens), the initiatory steps.

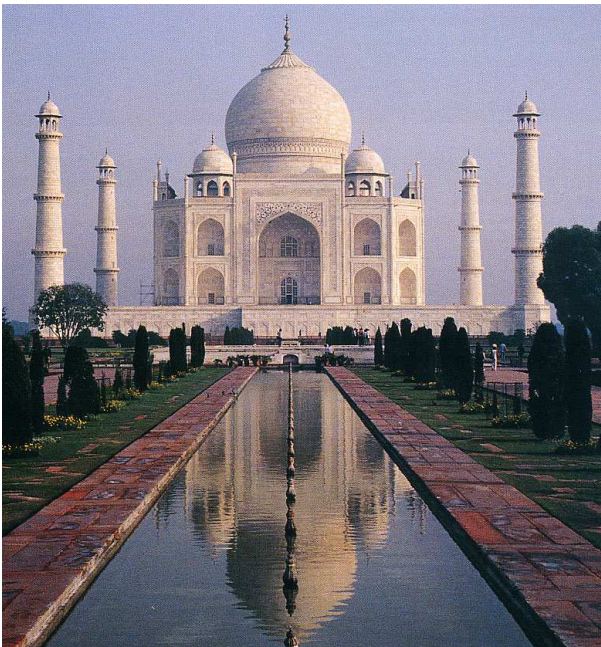


Fig. 13. Taj Mahal, India – expression of religious Muslim architecture devoted to love [32].

The *prestigious historical models* are related to the historical architectural archetypes that were very popular in ancient architecture and subsequently they have been implemented in the modern and contemporary architecture under various forms.

Thus, a number of Greek and Roman temples are to be found today in large-scale architectural constructions, yet adapted differently. Another example is the architectural complex of Saint Peter's Square in Vatican, designed by Gian Lorenzo Bernini, enclosed by a gigantic colonnade consisting of 284 columns, organized in four lines, with 140 statues, which basically reproduces the ancient architecture. The *abstract geometric patterns* are based on simple

geometric shapes (circle, square, rectangle, triangle, etc.) tailored to the needs of human habitation.



Fig. 14. Saint Peter's Square in Vatican [33].



Fig. 15. Empire State Building in New York, USA the expression of the new economic power [34].

These forms are used both in shaping the overall plan of the settlement and for the internal spatial allotment on which construction and buildings are designed.

This reality and way of thinking triggered the emergence and development of cubism in architecture, at the boundary between modernism and post-modernism, an art movement targeting primarily to the full exploitation and enhancement of volume/space thus the diminishing decorations. Represented by architects like Mies van der Rohe, Gropius, Adolf Mayer, Moholy-Nagy, Bauhaus movement does not adapt "architecture" to the consumer needs and the



ordinary citizen, although even from the start it actually aims to “mass production” and “consumer goods”, but manages to make the leap, the revolution by producing valuable architecture instead of famous “workers neighbourhoods” found during the British industrialization [11].



Fig. 16. Bauhaus Architecture by Ludwig Mies van der Rohe in Bockum, Krefeld [35].

The *aesthetic models* are derived from doctrines or programs that rely on a number of trends established by architects or artists. The most significant is the neoplasticism, a style of abstract painting proposing the decomposition of reality essence into fine elementary structures (simple) made up of lines, surfaces, primary colours and non-colours. A representative example is the architect Gerrit Thomas Rietveld whose architecture is based on the principle of decomposition into volume and surface lines (primary elements).



Fig. 17. The Rietveld Schröder House, 1924 [36].

Buildings have facades that seem exploded, deconstructed, with constructive elements that are highly obvious and in mutual isolation.

However, modern architecture can be understood differently as a new concept developed and debated by Giedion in his work *Space, Time and Architecture* that also focuses on time as its fourth 136

dimension in relation with space concluding eventually that the typical features of modern architecture, then, are simultaneity, dynamism, transparency, and many-sidedness; it is a play of interpenetration and a suggestive flexibility [13, p. 40]. In fact, the future architecture will decant in time and through successive filtrations, post-modernism for sure will identify new architectural expressions that today we cannot fully presume. We certainly believe that there is a possibility that the straight line will become curved.

### 3. RESULTS AND DISCUSSION

#### 3.1. Transferring architectural patterns on the physiognomy of cities

As the city is the economic, functional and cultural expression of the region it polarizes, the physiognomy of a city is the expression of architecture embedded within it. The combination of coherent architectural patterns with internal plotting, harmoniously and geometrically designed and integrated in an appropriate natural setting, always generates attractive physiognomies adapted for the human needs (see fig. 18).



Fig. 18. Palma Nuova city, Italy, built after a concentric layering in radial geometry [37].

Consistent architectural patterns can result only when the balance among the Vitruvian dimensions is reached at the level of each building within the architectural ensemble, which should be in accordance with the spatial zoning and comply with the urban regulations. If the new architectural patterns or constructions introduced into the architectural ensemble are inconsistent with the existing ones or present major imbalances of the Vitruvian triad, then they result in simply disgraceful, „inhabited/populated” and unattractive urban physiognomies.

The most common cases occur in the old part of the towns, in which most often new multi-storey



buildings are inserted, dominated by *firmitas* dimension with role of figuration (e.g. banks or corporate headquarters), in clear dissonance with the rest of the buildings, eventually affecting the historical townscape. However, more damaging than the physiognomy of cities is when the functional zoning and urban regulations make no clear distinction between sites designed for the implementation and development of architectural patterns, a situation leading to the emergence of an urban amalgam generically called *urban chaos* by Pierre von Meiss (2012) [12, p.61] (see fig. 19).



Fig. 19. Urban chaos in Cluj-Napoca, Romania (2013).

The most densely built urban environments are the residential neighbourhoods surrounding the city centre, or basically located at the periphery of the cities. They are mostly built sequentially, giving the impression of fragmented wholeness. The main principles guiding the planning of residential areas are still cost-efficiency, space limitation and rationalization. The result is almost always lacking in planning and style, giving the impression of random agglomeration, with almost no green areas, recreational places or pedestrian paths.

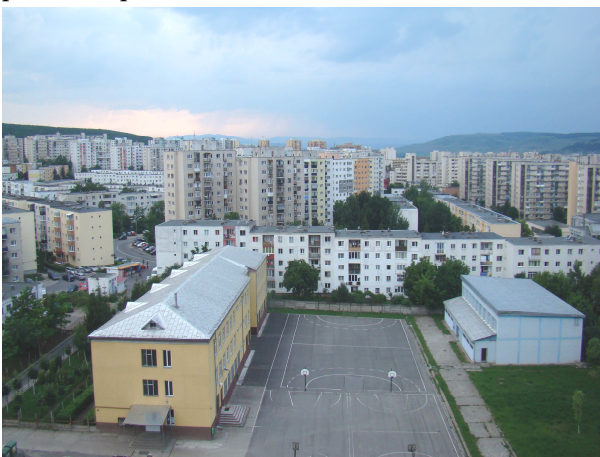


Fig. 20. Cubist architecture affected by specific ideology in the city of Cluj-Napoca, residential area of Mănăştur, Romania (2013).

Since, functionalism gains strength against aesthetics, we cannot discuss anymore about including beauty in these architectural sites. The traditional aspect of the former socialist residential worker area still remains dominant. The ideological interpretation of an architectural style like cubism as an example of the architectural avant-garde and imposing it on a large scale in urban architecture, due to more social than functional reasons, has led to the emergence of specific architectural pattern in which *firmitas* is dominant while *venustas* is absent altogether. The resulting urban physiognomy is faded, cumbersome, unincorporated, generating a residential environment totally against the lifestyle of postmodernism.

The roots of *Existenzminimum* (collective housing or subsistence dwelling) that characterizes the current residential neighbourhoods in Romania or the New Objectivity however, go way back, starting with the post war period at the beginning of the twentieth century. Once with the great depression, the great economic crisis, the new modernity concept implied the great use of rationality and functionality. The New Frankfurt project developed by Ernst May around 1928, promoted the principle of social and economic equality and homogeneity and it mainly aimed to ensure that the housing needs of the poor and the underprivileged were alleviated, as one aspect of the increasing emancipation of all individuals [13, p. 46]. Currently though, the same Taylorist principle of space management is determined by the increased demographic pressure on the urban area, on its turn caused by the high number of newcomers to the city. The highly agglomerated residential neighbourhoods are therefore giving the main personality of the urban life. This can leave deep scars on the individuals, even contributing to shape their personality. The low level of comfort (minimal floor space, bathroom and kitchen incorporated, blocks of flats separated by pedestrian paths) causes congestion in these residential ensembles, agglomerated by the poor population, with a lower level of culture and education, mostly represented by migrants from rural areas. Under these conditions, this architectural pattern tends to perpetuate, with few chances of improvement by actions of building modernization. Giving up this architectural pattern and trying to replace it with another cannot be even taken into account at the moment, this phenomenon (urban regeneration) usually occurring in economically rich cities (see fig. 22).

Having that in mind, we should note though that there are states where the issue of agglomerated monotonous residential establishments has already been managed, architects trying to come with more artistic solutions to provide the necessary urban housing (see fig. 21).

The two examples of contemporary works made in the modern urban architecture are in accordance with the Sigfried Giedion's vision on the

openness of space, interpreted by Hilde Heynen (1999) and stating that houses should not look like fortresses; rather, they should allow for a life that requires plenty of light and wants everything to be spacious and flexible. Houses should be open; they should reflect the contemporary mentality that perceives all aspects of life as interpenetrating [13, p. 36].



Fig. 21. Regeneration scheme by demolishing multi-storey blocks of flats in Glasgow [38].



Fig. 22. Bako Masterplan Belgrade – urban regeneration [39].

### 3.2. Reasoning for the dissolution of the Vitruvian triad

The evolution of the contemporary architectural design is of such complexity that would obviously make the subject of an extended study. However, we tried to focus on the immediate triggering factors, so visible and obvious to the eye, such as: financial and economic status, demographic pressure, lack and need of space, urban sprawl. Modernity on the other hand also means change, replacing the old and even diminishing the traditional.

The arguments for the contemporary architectural design, defined by simplicity and lack of

style and the state of *urban chaos* can be illustrated and structured into several main categories mainly triggered by factors such as: financial and economic efficiency, space limit, need and even lack of coordination. Eventually the most significant reflections we find in the residential neighbourhoods even though we cannot omit the other inner urban areas such as: the old town, the historical city area or the business area.

*Income and standard of living* need to be first considered since most of the population register income values far below the cost of construction and barely succeed to secure housing needs, therefore accepting and being able to afford to buy shelters and not stylized housing. This state of facts has determined the real estate developers to construct quite simplified residential housing without any architectural personality, localized mostly at the periphery of the city. Therefore, the purchasing power of the urban population, whether local or incoming, rather influences the development of the residential areas (location, size, and price) because as P. Townroe (1996) stated even though some of the social groups are kept in step in relative growth terms, their incomes would diverge in absolute terms [15, p. 192]. The effects are seen and reflected through the architectural typology of the urban areas and position of the housing buildings within the borders of the city, yet differentiated by the purchasing power resulting in several categories of residential neighbourhoods.

*Cost of land, urban infrastructure, construction materials and execution* are still very high compared to most of the population's purchasing power, thus construction registering very high prices. In this case investors do not insist on the beauty dimension and tend to simplify to the maximum all the other dimensions. Thus cost-efficiency and rationality prevail.

*Transition from modernism to postmodernism* without widely understanding the concept or even ignoring it. In this regard we notice primarily hybrid or gaudy architectures where the Vitruvian triad is flawed as proportion of representation either partly or even completely removed. Modern architecture has been debated by many, inclusive works being done among which we note those done by Matei Calinescu in 1977 or Hilde Heynen in 1999. And if we go further into the meaning of the dwelling per se we cannot but notice the great debate on its meaning facing the modernity made by Massimo Cacciari and Norberg-Schulz, based on Heidegger's homelessness. While Norberg-Schulz believes in the modern figurative architecture and the symbolism of the building, with its three features (image, being concrete, and having significance) and its meaning given by the existence of *genius loci*, Cacciari argues for the non-existence of any meaning since real dwelling no longer exists, and authentic building has also disappeared. The only thing left over for architecture is to reveal the impossibility of poetical

dwelling through architecture of empty signs [13, pp. 8-25].

*The influence of totalitarian regimes* that have influenced the urban development by imposing austere architectural styles in accordance with their doctrine. The major influence on the Romanian urban architecture, especially the residential architecture was the communist doctrine. During the industrialization process after the 1960's the urbanization began, therefore housing for the workforce becoming increasingly necessary. The great symbols of the communist period are the apartment blocks, multi-storey, multi-dwelling grey buildings, structurally built and arranged, based on functionality and rationalisation principles, mainly aimed for the placement of the newly come workers from the rural areas. For most of the industrialized countries, like the states in the eastern European block, housing for the average and low-waged population meant living in these apartment blocks. Even if the socioeconomic background has changed, the majority of urban population still considers the residential neighbourhoods as the first place of housing, determining somehow the enhancement of residential segregation.

*Increasing demographic pressure on the urban areas* determined by rural-urban migration and the need for shelter that causes a demand growth. Rural poor migration to the cities determines an increasing unsupported pressure, and eventually a reckless urban sprawl [2, p. 7], which correlated with the low purchasing power of the population, determines a cheap and styleless construction boom. In a situation of high population growth ...maximum pressure is put upon city governance (Mohan, 1994, cited by Peter M, Townroe, p. 193) in which case the city government ... finds itself faced with an avalanche of demands for additional housing...(Gilbert and Gugler, 1992, cited by Peter M, Townroe, p. 193) [15, p. 193]. Against all these, as Richard Rogers argued, sustainability should though become the guiding principle of modern urban design [2 p. 5].

*The large use of prefabricates in construction*, which is a cheap solution and does not stimulate the implementation of venustas dimension in their architecture.

*The increase of natural hazard phenomena* and tendency to emphasize on firmitas dimension. Spatial planning must take into consideration the vulnerability of an area to natural hazards and the risk of occurrence since it can have economic consequences. Risk management implies protective measures as reactions to disasters, recovery after disasters or preparedness for disasters, therefore insisting on the durability of the building, even though this triggers high costs. Disaster mitigation in this case focuses on the structure of the buildings, looking for long-term solutions to reduce the risks against the occurrence of

natural disasters like the need for solid foundations, or setting up housing projects constructed under building codes designed to withstand any hazard that would result in less destruction [17, p. 130].

*Poor quality of the management of urban development* due to the lack of coherent housing and planning policies for a long time.

*Practicing import mimicry* without proper adjustment to the national and local context, which is mainly observed in case of bank offices, great international corporations.

*Gradual replacement of artistic relevance by the utility relevance* in case of buildings within the urban landscape.

*Changing public perception about buildings.* Construction is seen as a commodity with a certain time frame, mainly emphasizing on functionality.

*The prolonged economic crisis* and adoption of architectural and urban solutions specific to crisis aiming to design only low-priced housing shelters and not low-priced and ecological housing in accordance with the concept of bioclimatic architecture.

*The crisis of architectural identity* of the postmodernism due to the decline of social and existential order.

*The trend of streamlining constructions even from the project phase* in accordance with their purpose in order to reduce the costs of execution and widespread use of recyclable materials. According to this concept, the structure of any construction/building must be dimensioned only for the purpose it is designed, discharging of any other historical features, holding aesthetic or representation dimensions (in this case we explicitly refer to Venustas dimension) [16, p. 62].

*The trend of architects and planners to construct buildings not cities*, neglecting the fact that the value of a building stays in the architectural whole.

### **3.3. Effects of changing proportions between triad's dimensions or total absence of one of them**

a). *Emergence of discordant architectural ensembles.* Mixing the new with the old usually leads to incompatibility within the architectural ensemble, and should be avoided [14]. The incorporation of a new building whose design employs part of the Vitruvian dimensions within an existing architectural ensemble whose architectural style encompasses the whole triad leads to disarticulation of the existing architectural ensemble.

b). *Emergence of residential ensembles (whole neighbourhoods) which only partially incorporate two vitruvian dimensions (firmitas and utilitas).* In this case they result in unhealthy inoperative urban ensembles, which only partially fulfil the function of habitation (dwellings perceived like shelters) that have



serious repercussions on the population, especially the young (lower standard of living, lower comfort level, poor public facilities, lack of green and recreational spaces, high level of agglomeration, high crime levels, emergence of street gangs).

c). *Manifestation of urban segregation* due to social segregation and the formation of uneven urban ensembles. As *widening of wage differentials* has as classical consequence social exclusion or segregation ([15, p. 191]) in this case also, wealthier population do not longer accept living in unincorporated residential architectural ensembles and they concentrate in rich neighbourhoods whose architecture is largely stylized (even though Vitruvian dimensions are not always entirely present in architecture. For example, the Palaces of Roma population or of the overnight wealthy people thus result in not only demographic but urban segregation, too.

d). *Uncontrolled expansion of cities*, phenomenon triggered by urban segregation, expressed by the outpouring of the new neighbourhoods of the rich to the urban periphery, which determines further enhancement of urban management issues.

e). *Increased pressure on the urban green spaces* due to often abusively occupation of the wealthy people with the purpose of building residential houses. The most flawed areas are the urban forests, which prove to be very attractive for the development of new residential implants.

f). *Impaired functional zoning and urban regulation* especially in the residential ensembles affected by dissolution of the Vitruvian triad.

g). *Emergence of urban resilience*, phenomenon determined by the occupation of buildings with little architectural features by the incoming rural poor population are by the relocated urban population.

h). *Emergence of urban regeneration and architectural rehabilitation of sites* affected by the dissolution of the Vitruvian triad. This is specific to the rich cities with high living standards.

## 5. CONCLUSION

Continuous debate on the importance of the basic architectural features, the supporting arguments being as strong as those in opposition, each of the parts emphasizing on specific and indispensable elements for the evolution of architecture. Knowing and using the three basic dimensions in the contemporary architecture is back into discussion since there are increasingly numerous cases in which buildings only partially express any of them or do not at all. It is true that the debates on the maintenance of one or some of the dimensions, replacing the others or adding up or dismissing completely are true and relevant, since the boundary between the existence and inexistence of the basic features proves to be not firm but rather elastic.

Our debate does not focus on who is right, or which way is better to go from here on, but on the importance of a structural identity of buildings that should support the urban architecture and housing projects in order for the population benefit of it from all perspectives (socially, economically, psychologically) and not lose ground in favour of chasing profit, or maximum management of the investment, facts that usually lead to the degeneration of architectural styles, cities ultimately transforming into copies of the same urban structure.

At first sight, *firmitas* appears implicitly necessary, *utilitas* gains power due to the contemporary socio-economic context: demographic pressure, urban sprawl, lack of space, whereas *venustas* is at a loss due to the stringent necessities for space but also due to the changing perception of the population on dwelling, house or building. Even though it has been replaced by functionality, beauty is still present and proves its indispensability in the central urban areas and the old historical urban areas.

Still, there is a focus on the concept of aesthetics of the functional space, which can result from the combination of utility and soundness in an attractive manner. On the other hand, aesthetics are of significant importance in the case of urban regeneration plans applied by the rich states.

The identity of the residential areas has little changed compared to the former ideology in case of Romania, even though influenced by the privation of housing, mainly due to the demographic pressure.

However, urban segregation becomes more visible, mostly in favour of the rich, but also regarding the low and average income population

The phenomenon of blending identities is evident in case of urban central area due to the implants of new buildings within traditional architectural ensembles determining a certain disruptive image.

Concluding, the architecture of the future cities in the post-industrial period, in which idealists emphasize on the symbiotic relationship between man and nature, also employs the Vitruvian dimensions, which have represented and will still be the essentials in architecture and subsequently in urban planning. And this is because when blending them it results the line and the architectural style, which is one of the basic premises for the planning and development of a sustainable habitat.

## REFERENCES

- [1] **Rabun Taylor**, (2003), *The Roman Builders. A study in Architectural Process*, Cambridge University Press, Available at: <http://catdir.loc.gov/catdir/samples/cam033/2002073306.pdf>
- [2] **Richard Rogers**, (2008), *Cities for a small planet*, Available at: <http://books.google.ro/books?id=>

s8WO3zT1sUwC&printsec=frontcover&source=gbs\_ge\_summary\_r&cad=0#v=onepage&q&f=false

[3] **Gunter A. Dittmar**, (2000), *Architecture as Dwelling and Building. Design as Ontological Act*, published in *Bauen und Wohnen / Building and Dwelling*, Eduard Führ, Hg. /ed.(Waxmann; Münster, New York, München, Berlin), Available at: [http://www.tu-cottbus.de/theoriederarchitektur/Wolke/eng/Subjects/982/Dittmar/dittmar\\_t.html](http://www.tu-cottbus.de/theoriederarchitektur/Wolke/eng/Subjects/982/Dittmar/dittmar_t.html)

[4] **Jeremy Till** (2007), *Architecture and Contingency*, in *Field*, a free journal for architecture, vol. 1 (1), available at: [http://www.field-journal.org/uploads/file/2007\\_Volume\\_1/j%20till.pdf](http://www.field-journal.org/uploads/file/2007_Volume_1/j%20till.pdf)

[5] **Henry Wotton** (1624), *The elements of architecture*, Available at: <http://books.google.ro/books?id=zTNJAAAAMAAJ&printsec=frontcover#v=onepage&q&f=false>

[6] **Joseph Gwilt** (1826), *Rudiments of Architecture*, Available at: <http://books.google.es/books?id=GxWU3J81TnwC&printsec=frontcover&hl=en&v=onepage&q&f=false>

[7] **Tom Spector** (2001), *The Ethical Architect: The Dilemma of Contemporary Practice*, Princeton Architectural Press, New York, Available at: [http://books.google.ro/books?id=EZ\\_9YllZjC8C&pg=PT153&lpq=PT153&dq=The+Ten+Books+on+Architecture+by+Morris+Hickey+Morgan,+originally+published+in+1914&source=bl&ots=pI8-q4PN2r&sig=c28f-V31ZewKcG1g8VsRKKLydMg&hl=en&sa=X&ei=Ph7gUZQRhfayBsHCgagO&ved=0CFcQ6AEwBw](http://books.google.ro/books?id=EZ_9YllZjC8C&pg=PT153&lpq=PT153&dq=The+Ten+Books+on+Architecture+by+Morris+Hickey+Morgan,+originally+published+in+1914&source=bl&ots=pI8-q4PN2r&sig=c28f-V31ZewKcG1g8VsRKKLydMg&hl=en&sa=X&ei=Ph7gUZQRhfayBsHCgagO&ved=0CFcQ6AEwBw)

[8] **Eric Inman Daum** (2009), *Commodity, Firmness, and Delight, or Toward a New Architectural Attitude*, Presented at the Traditional Building Conference, March 10, 2009, <http://classicistne.wordpress.com/2010/12/13/commodity-firmness-and-delight-or-toward-a-new-architectural-attitude/>

[9] **Touw, Katrina** (2006), *Firmitas re-visited: Permanence in Contemporary Architecture*, Waterloo, Ontario, Canada, <http://www.uwspace.uwaterloo.ca/bitstream/10012/2858/1/kltouw2006.pdf>

[10] **Criticos, Mihaela** (2007), *Limbaaj arhitectural*, note de curs, Departamentul de Istoria și Teoria Arhitecturii și Conservarea Patrimoniului, Universitatea de Arhitectură și Urbanism "Ion Mincu", București, Available at: [http://www.uaum.ro/departamente/itcp/discipline/limbaaj\\_arhitectural/note\\_de\\_curs\\_LA1\\_2007-2008.pdf](http://www.uaum.ro/departamente/itcp/discipline/limbaaj_arhitectural/note_de_curs_LA1_2007-2008.pdf)

[11] \*\*\* *Arhitectura interbelica in Romania*, <http://www.scrigroup.com/casa-masina/arhitectura/ARHITECTURA-INTERBELICA-IN-ROM42576.php>

[12] **Pierre von Meiss** (2012), *De la forme au lieu. Une introduction à l'étude de l'architecture. Troisième édition revue et argumentée*. Presses polytechniques et universitaires romandes. Available at: [http://books.google.ro/books?id=9LKoobT8iAwC&printsec=frontcover&hl=ro&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](http://books.google.ro/books?id=9LKoobT8iAwC&printsec=frontcover&hl=ro&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)

[13] **Hilde Heynen** (1999), *Architecture and Modernity. A Critique*, MIT Press, Cambridge, Massachusetts, [http://www.mom.arq.ufmg.br/mom/arq\\_interface/1a\\_aula/Architecture\\_and\\_Modernity\\_A\\_Critique.pdf](http://www.mom.arq.ufmg.br/mom/arq_interface/1a_aula/Architecture_and_Modernity_A_Critique.pdf)

[14] **John G. Williams** (2008), *Architectural Control Guidelines for Ground - Related Residential Development, City of Brampton*, Available at: <http://www.brampton.ca/en/Business/planning-development/Documents/CD/UD/UDS/Brampton%20ACGRRD%20080717%20final.pdf>

[15] **Peter M, Townroe** (1996), *Urban Sustainability and Social Cohesion, in Sustainability: The Environment and Urbanization*, edited by Cedric Pugh, p. 179-196. <http://books.google.ro/books?id=959YxxBRMpgC&printsec=frontcover&dq=subject:%22Citie+s+and+towns%22&hl=en&sa=X&ei=gqBJUfsqxcSoBoqjgbgG&ved=0CFcQ6AEwBw#v=onepage&q&f=false>

[16] **Petrea, C. S., Moleavin, A.** (2012), *Proiectarea de arhitectură în timp de criză*, în *Urbanism, Arhitectură, Construcții*, vol. 3, nr. 4., INCD URBAN-INCERC, București. Available at: <http://uac.incd.ro/Art/v3n4a07.pdf>

[17] **Lelisa Sena, Kifle W. Michael** (2006), *Disaster Prevention and Preparedness, Lecture notes for Health Science students*, EPTHI, Ethiopia, Available at: [http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture\\_notes/health\\_extension\\_trainees/DisasterPreventionPreparedness.pdf](http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_extension_trainees/DisasterPreventionPreparedness.pdf)

[18] \*\*\* (2006) *Designing for Earthquakes. A Manual for Architects providing protection to people and buildings*, Risk Management Series, FEMA 454 / December 2006, Earthquake Engineering Research Institute (EERI) of Oakland, California, available at: <http://www.wbdg.org/ccb/DHS/fema454.pdf>

[19] **James, F. O'Gorman** (1998), *ABC of Architecture*, University of Pennsylvania Press, Philadelphia Available at: [http://books.google.ro/books?id=rzc6vh68oFMC&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](http://books.google.ro/books?id=rzc6vh68oFMC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)

[20] **Sirowy, Beata** (2010) *Phenomenological Concepts in Architecture. Towards a User-Oriented Practice*, Available online at: <http://www.aho.no/PageFiles/1752/thesis%20sirowy.pdf>

[21] [www.wright-house.com](http://www.wright-house.com)

[22] <http://anengineersaspect.blogspot.ro/2009/10/22-pier-luigi-nervi-structures-on.html>

[23] [http://desktopwallpaper-s.com/63/-/Burj\\_Al\\_Arab\\_Hotel\\_-\\_Dubai,\\_United\\_Arab\\_Emirates](http://desktopwallpaper-s.com/63/-/Burj_Al_Arab_Hotel_-_Dubai,_United_Arab_Emirates)

[24] [http://ro.wikipedia.org/wiki/Fi%C8%99ier:La\\_Rotonda.png](http://ro.wikipedia.org/wiki/Fi%C8%99ier:La_Rotonda.png)

[25] <http://myriammahiques.blogspot.ro/2011/06/icomos-counseling-against-le-corbusiers.html>

[26] <http://www.shareconference.com/us/hotel>

[27] <http://www.archdaily.com/6186/glass-bottling-plant-cristalchile-guillermo-hevia/>

[28] <http://guzgan.ro/tags/sediu+ING>

- [29] [http://cazare.info/obiective-turistice/palatul-parlamentului-din-bucuresti-casa-poporului.html#prettyPhoto\[pp\\_gal\]/o/](http://cazare.info/obiective-turistice/palatul-parlamentului-din-bucuresti-casa-poporului.html#prettyPhoto[pp_gal]/o/)
- [30] <http://www.colorcoat-online.com/blog/wp-content/uploads/2012/08/Birdsnestchina1.jpg>
- [31] <http://www.epdlp.com/edificio.php?id=2288>
- [32] <http://www.hdwallpapersplus.com/taj-mahal-pictures.html>
- [33] [http://www.jinfotours.ro/detalii\\_bella\\_italia.html](http://www.jinfotours.ro/detalii_bella_italia.html)
- [34] [http://www.travlang.com/blog/wp-content/uploads/2010/04/empire-state-building\\_22.jpg](http://www.travlang.com/blog/wp-content/uploads/2010/04/empire-state-building_22.jpg)
- [35] <http://www.panoramio.com/photo/26815981>
- [36] <http://thegenealogyofart.tumblr.com/page/2>
- [37] <http://www.e-antropolog.ro/wp-content/uploads/2012/05/8.-Ora%C8%99ul-Palma-Nuova-Italia.jpg>
- [38] <http://www.insidehousing.co.uk/development/gha-demolishes-iconic-multi-storeyblock/6522276.article>
- [39] <http://www.designboom.com/architecture/zaha-hadid-beko-masterplan-in-belgrade/>