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Understanding Architectural Transformation: A Lesson for Young Architects

Shahid Mansoor Khan * Mir Wali Shah † Adnan Anwar ‡

Abstract *Architecture goes through a steady yet extremely slow process of evolution which is, most of the time, hardly observable in centuries. The process of architectural transformation has rarely been described holistically in the available literature; therefore, there is a need to explore and present this important process in the simplest possible manner for a better understanding of the young architects as well as students. The focus of this descriptive study was to explore the available literature on this important topic and to create a simple, precise and meticulous descriptive summary for the better understanding of young architects. Data used in this literature-based article was mostly secondary; however, it was tried to summarize the entire discussion in diagrammatic form. The study suggests practitioners should not opt for sudden and drastic turns in the architecture in terms of spatial configuration, formal compositions, and technological interventions as these may result in the acceleration of psychological and perceptual stress in users as well as the viewers.*

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Introduction

Architecture is placed in the category of artistic creations and is mostly referred to as frozen music in the literature (Sendhil et al., 2020; Tokhmechian, Gharehbaglou, & Technology, 2017). The available literature presents a complex definition of the term (Snyder, Catanese, & MacGintry, 1979), scattered information on the various processes related to the field and difficult theories on the perceptual role of architecture (Hooper, 1978; Polat & Sagi, 1994). As a matter of fact, processes responsible for the outcome in the outline of particular building form, spatial configuration and symbolic arrangements have never been static. Architecture continuously undergoes the process of transformation and evolution. Transformation of architecture is dependent upon a number of major and minor factors which may steadily and sometimes vigorously affect the entire evolutionary process Agarwal et al., 2021; Partida & D. Katsonopoulou, 2016 Note-worthy among these factors may be placed in the categories of natural disasters, technological innovations, advancements in the construction materials and changes in cultural norms and patterns. However, shifts in theoretical paradigms may also culminate in the accelerated pace in the process of architectural transformation. For example, the widespread thirst for sustainability in the contemporary era is focusing maximum possible changes in the design of existing buildings to minimize energy utilization (Jensen, Kamari, Strange, & Kirkegaard, 2017). The need is to present the process of architectural transformation in the simplest possible terms for the education of young architects and awareness of the general masses.

Statement of the Problem

Young architects and students of architecture

* Assistant Professor, Department of Architecture, University of Engineering and Technology, Abbottabad Campus), KP, Pakistan.
† Assistant Professor, Department of Architecture, Hazara University, Mansehra, KP, Pakistan.
‡ Assistant Professor, Department of Architecture, Hazara University, Mansehra, KP, Pakistan.
Email: adnananwar.khan@gmail.com

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face difficulties in understanding and describing the phenomenon of architectural transformation in a particular region in specific geographic, social and technological settings due to the unavailability of authentic, precise, yet meticulous relevant literature.

Objective of the Study

The only objective of this descriptive study is to explore the available literature on the topic "transformation of architecture" and to create a simple, precise and meticulous descriptive summary for a better understanding of young architects.

Methodology

The study is based on the collection and exploration of available literature on the topic, extraction of relevant information and presentation of the authentic information in a descriptive manner. It was tried to omit complex mathematical equations to achieve simplicity without compromising the sequential format of the various aspects.

Transformation of Architecture

The word transformation can be defined as coming into a form different from the original one or occupying a new position. Conceptually, the word also encompasses the literal meaning of the word change which refers to the process of becoming something different from the original one. On the other hand, the word transformation describes the process between the two phases of the word "change" (Durmus, 2012).

Contemporary globalization trends have transformed the economy, politics and technology from a narrower regional parameter to a broader universal perspective. These are the factors that have a direct role in the transformation of architecture (Durmus, 2012). However, the term may not be confused with the transformation design, which is "a human-centred, interdisciplinary process that seeks to create desirable and sustainable changes in behavior and form – of individuals, systems and organizations – often for socially progressive ends" (Burns, Cottam, Vanstone, & Winhall, 2006). Architecture, just like other aspects of human culture and life, also goes through the process of evolution in terms of the configuration of spaces, formal arrangement and organization, and most importantly, the types and numbers of metaphors incorporated and how these are interpreted by the users and viewers. This process of evolution, when it brings perceivable changes in the afore-mentioned parameters of architecture, may be referred to as transformation of architecture which is dependent on a number of tangible and intangible factors.

Types of Architectural Transformation

As discussed earlier, architecture being the dominant part of the human-built environment, goes through the process of evolution and transformation in terms of space, form and linguistic clues – both vocabulary and syntax. Discussions and criticism on the process of transformation usually focus on the form, aesthetics, function and responsiveness to aspects attributed to sustainability, assuming the architect as a neutral agent. To some extent, it is true that an architect has to do a little by him or herself, yet being a human being and part of a particular society having specific cultural norms, cannot always be completely neutral at all (Davis, 2008).

Depending upon the causes and background agents, the speed of transformation in architecture may be as quick as to measure changes even in a few years. On the other hand, it may be as slow that there could be a negligible observable change in centuries.

Architectural transformation can be categorized into the following:

i. Transformation in spatial configurations
ii. Transformation in formal configurations
iii. Transformation in metaphor and clues

Spatial configuration is a depiction of the social setup of the community; formal configurations guide towards the prevailing aesthetic values, whereas metaphors and clues have more to do with the cultural norms followed by the community.

Transformation in Spatial Configurations

To analyze and measure transformation in spatial configurations, usually, the space syntax method is adopted (Toker & Toker, 2003) in which isovist, axial space and convex space are identified, and properties of integration, choice and depth distance are used as a criterion for the analysis (Bafna, 2003; Ratti, 2004). Studies have proved

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that transformation in spatial configuration at a household level takes place in a limited period of time as only a century of changes in family structure occur (Toker & Toker, 2003). The changes may also occur in even lesser time in case a disaster hits a certain community destroying most of its infrastructure and rebuilt by external agencies without considering the socio-cultural needs of the community. People may try to transform, mold and adapt these alien structures to fit their own needs, yet incorporating some of the dominantly visible features brought in by the external agencies (Duyne Barenstein, 2015).

In normal circumstances, transformations in the spatial configurations are not perceivable as the pace of change is very slow. Changes may be recordable after centuries. This is a process of evolution depending upon the existing social values of the society primarily and then upon the economic setup of the dwellers.

Transformation in Formal Configurations

Geometric transformation of shapes and forms is not a new phenomenon in the field of architecture and has been practised for centuries. Shape transformation is usually categorized into Eucledian and non-linear types. These transformations are associated with certain fields of science and mathematics (Figure 1). Shapes, when transformed, may retain a few properties and change others (Celani & Martins, 2007).

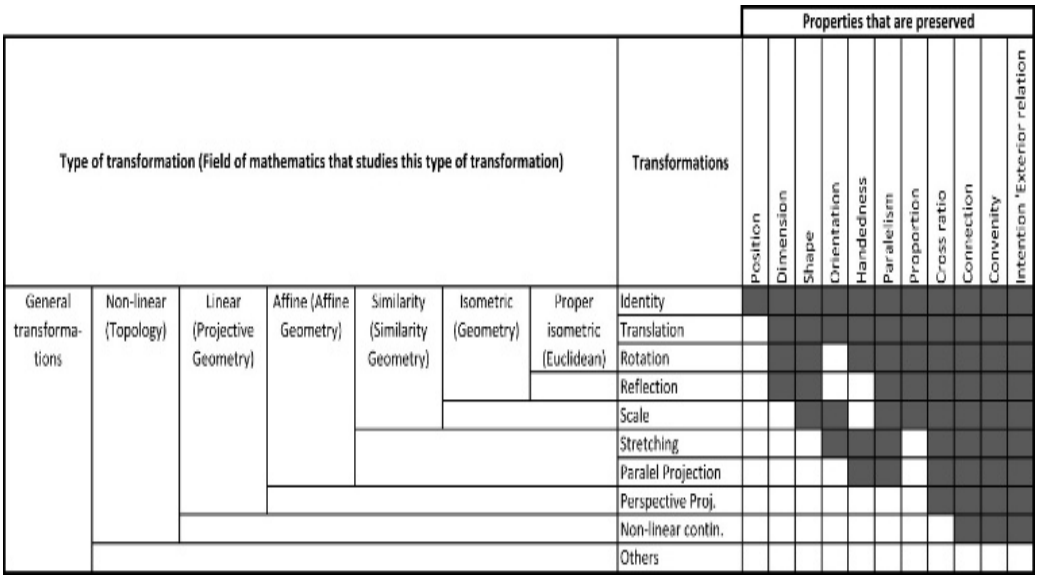

Figure 1: Shape Transformations, According to Preserved Properties

Source: Reconstructed from Celani and Martins (2007)

Traditionally, geometric shapes in architecture were transformed by applying universal principles of rhythm, balance and proportion. Contemporary architects such as Santiago Calatrava also play with the geometric transformation of shapes following the movements of a human posture instead of following the traditional path set by the ancestors. Their work is called bio-morphic by some scholars due to this particular reason (Celani & Martins, 2007). According to others, "the implied nakedness in biomorphic forms demands the infusion of the surface with the structural frame, if not the virtual unity between matter and form" (Hartoonian, 2009).

Architectural form being a three-dimensional entity may be transformed into a new or changed perceivable unit following the principles of dimensional transformation, subtractive transformation or additive transformation (Ching, 2014; Von Meiss, 2013; Wong, 1993). This kind of architectural transformation is a depiction of the community's aesthetic standards and values. The building

form is a mere ring of the long aesthetic chain observable in the dresses, drapery, bridal wears, rugs and other articles of daily use. The form is also inclusive of colour codes followed in the overall theme of the building and is reflective of other aspects of human life, as discussed earlier.

The pace of architectural transformation in terms of shape and form is accelerated in times of emergency and disaster; otherwise, it remains slow in normal circumstances. However, a major turn in the construction material and technique may bring sudden and observable changes in the formal transformation of the architecture of a particular community.

Transformation in Metaphors and Clues

According to Charles (1978), "metaphor plays a predominant role in the public's acceptance or rejection of buildings". Metaphoric interpretation of buildings and their symbolic character evolve through decades, and it may or may not live long depending upon the speed of transformation in the socio-cultural norms and values of the society. Architecture does not mean the mere erection of buildings and structures; it rather has to do more with the reflection of predominant persisting socio-cultural values of the society. A piece of architecture without a sufficient number of encoded clues make the users' observation boring, and they find the minimum or even no interest in such buildings (Gerber & Patterson, 2014).

A building may last for centuries, but its metaphoric interpretation may change more rapidly and even in decades a number of times. So an architect needs to over code his or her buildings with a number of metaphoric codes to make them livable for centuries (Charles, 1978).

The social structure of the community plays a vital role in the symbolic standing of a building. Shahi Qilla Lahore and Taj Mahal Aagrah may be quoted as examples in this regard. These were once the symbols of royal dignity, but now their role is just a piece of entertainment and leisure.

Administration of new spatial organizations, the introduction of formal configurations which are different from the existing historically evolved arrangements and introduction of new elements in the overall theme and building envelop of the structures may face a mass rejection from the community at earlier but may become an integral part of the metaphorical interpretation of the architecture with the passage of time (Mical, 2005).

Causes of Transformation

Transformation of architecture is a natural phenomenon and cannot be stopped through human interventions though its pace may be controlled or accelerated by adopting appropriate measures. In either case, the understanding of the correlation between contextual causes and architectural consequences is important (Dudek & Blaise, 2010).

Depending upon the intensity of impact, contextual causes may be broadly categorized into instance causes and steady causes. Natural or man-made disasters fall in the instance causes as they bring immediate and visible changes in the architecture of affected communities. Among the steady causes advance in materials and construction techniques and evolutionary changes in the socio-cultural norms and values of the target community. Technological advancements and material related innovations may also be a part of the post-disaster rehabilitation interventions, but they are thought to be an independent transformational agent when it comes to the discussion of architectural transformation.

Disasters

Disasters are held to be responsible for rapid transformational changes in the architecture of a particular society when compared with other normal causes. Usually, as a post-disaster rehabilitation process, external donors and construction agencies approach the affected communities, bring in their own ideas related to space, form, material and technology, and reconstruction takes place without the active participation of the community. In some cases, communities are relocated to new destinations as well. Studies reveal that most of the time, all such interventions culminate in total failure as relocations revert and constructions end up in vandalism to suit the socio-cultural needs of inhabitants (Upadhyay, 2013).

One of the most frequently quoted examples of architectural transformation resulting from man-made disasters is the internationalism and modernism during the post-war era of World War

II, in which a mass scale and apparent transformation in all three architectural aspects could be visible. In other cases, architectural transformation takes place as pre-emption of war and subsequent disasters (Shalamanov et al., 2005).

Technology and Material

One of the most apprehensible causes of the architectural transformation is the introduction of new materials and developments in the available construction technology. The Chicago School of Architecture can be quoted as an authentic example of this phenomenon. Innovation of building steel and wide glass pans made the erection of multi-storey buildings easier, quicker and safer. Huge glass windows, steel frames and minimum decorations on the building facades were the major features of Chicago School and other contemporary styles in France – and in other countries of Europe as well – which acted as foundation and base for the well-known modern architecture (Lee, 1996).

Similarly, the invention of reinforced cement concrete as building material brought plasticity and strength in the hand of the architects of the late nineteenth and early twentieth century who experimented on the new forms, unique spatial configurations and unprecedented metaphorical communication through architecture. Many of the architectural movements are the result of new innovations in the line of building materials and construction technology (Klassen, 2004). Examples of this argument may be Art Nuova, Brutalism, Modernism, Expressionism etc.

Innovations in construction materials is a perpetual and non-stop phenomenon. Experiments are being done on new building materials, and consequently, building forms, spatial organization, and semiotic interpretation also change with the introduction of new material. Some of the architects hold that the future of architecture lies in the use of plastics as building material (Blaine, 2015).

Cultural Identity

"From an architectural point of view, the awareness of both cultural identity and sustainability is really a gift from the society, the consumer and the clients to the profession" (Elgaard, 2015). The transformation of architecture in terms of cultural identity is dependent upon economic, regional and global changes (Mahgoub, 2007). It is thought by folks and even a number of architects that being modern means compromising on regional cultural identity in architecture (Lu & Li, 2008).

Movements like Regionalism, Classicism, Vernacularism and many other similar were the result of blurred or even missing regional cultural identity in linear, blunt-faced modern buildings constructed in bulk throughout the globe irrespective of the existing local socio-cultural values. It was difficult and sometimes impossible for the communities to accept such buildings, which were an apparent contradiction with the locally evolved construction styles coded with locally understandable clues.

Culture being a dynamic entity, always goes through evolutionary changes, but these changes are steady and gradual, therefore easy to be adopted by the communities. People want to reflect and observe these steady changes in their buildings but are never ready to accommodate sudden or abrupt changes in this regard.

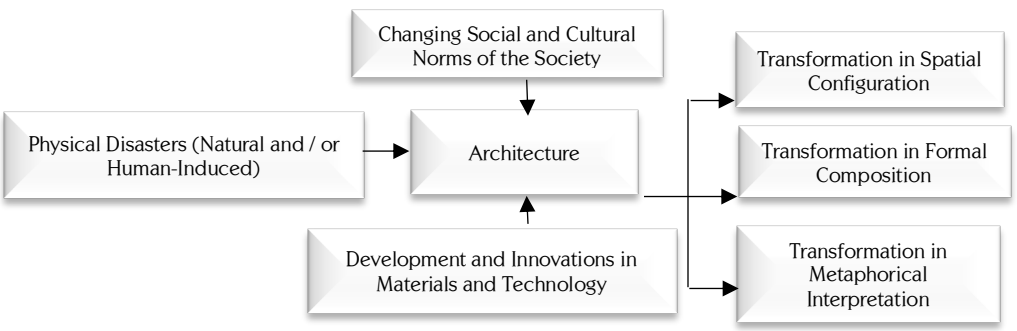

Figure 2: Causes of Architectural Transformation

Source: Authors

Conclusion

The dictionary definition of disaster states that it is a sudden accident or natural catastrophe causing great damage or loss of life (Stevenson & Waite, 2011). This definition applies to all fields and aspects of human life, including architecture, but the definition needs to be revised and restated when it comes to architectural disasters. In a nutshell, the term may be defined as uprooting the spatial configurations, formal organizations, and semiotic vocabulary depicted through prevailing architectural practices of a specific region evolved through centuries by introducing alien styles, materials and techniques. The practice may culminate in the total loss of regional identity and devastation of socio-cultural as well as religious norms and values associated with particular architectural styles.

The issue becomes critical in disaster-affected areas where rehabilitation and reconstruction activities are carried out by external donors and foreign agencies who are enthusiastic about leaving their own imprint in the form of the built environment on the local community. These changes are, in most cases, irreversible on the one hand and entirely unacceptable for the dwellers on the other hand. The indigenously evolved architectural identity is lost and vanishes all of a sudden, depriving the inhabitants of their affiliations with their culturally rich past.

Similarly, practices fantasized by certain theoretical terms without having a deep insight into the essence of these terminologies may ruin the regional and cultural identities. The best presentable example is the term sustainability. Young architects unintentionally interrupt the steady transformation of the architecture in a particular region by either imposing alien spatial arrangements in the designs or by introducing non-indigenous forms and materials.

It is suggested that young practitioners in the field and students must learn and respect the prevailing regional practices through extensive case studies before undertaking new design assignments.

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