Modern approaches to preservation and development of historical objects of culture

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Abstract. Architecture is always a memory tool. Connection between architecture and history is one of the necessary aspects of social existence and professional comprehension of the art of building. Each epoch leaves its trace in architectural works of art. Development of equipment and technology changes internal space of outstanding architectural structures inevitably fast and sometimes affects their appearance as well. Natural and man-made disasters and wars cause multiple reconstructions, as a result of which the initial image of a building transforms, which makes it look more contemporary, understandable and attractive for people.

The first part of the article identifies the main principles of arrangement of additional functional spaces of developing objects of culture. Further on, museum and theatre complexes, on the basis of which an analysis of social, urban-planning and technology factors that influence their formation and aesthetic image is carried out, are researched. Results are summarized and conclusions are made.

1. Introduction
In various historical epochs, cities were different. Each historical period had left a certain mark on their appearance [1]. Modern cities have become a habitat for hundreds of millions of people; they concentrate enormous manufacturing forces; they are the main source regions of culture as well as of economic and social progress [2]. Lately, urban environment has been constantly transforming, exposing itself to the influence of most recent technologies, searching for innovative styles and new concepts of urban planning. Under these conditions, a necessity to reconstruct already-existing historic buildings, in which objects of cultural heritage hold a special place, comes into existence [3-5].

Over many decades, the world has got a huge experience in developing cultural heritage objects using various methods of solving the inevitable natural growth in their number. It happens with more frequency that modern multi-functional complexes get developed on the basis of an old historical building. New structures get constructed upon an already-existing building; it gets heightened and rearranged, its layout being unintentionally distorted. Of course, the initial project might have functional and compositional downsides caused by various circumstances; these downsides get eliminated in the course of further development. As a result, the initial architectural appearance of the object gets significantly deformed [6-8].

2. Fundamental principles of arrangement of additional functional spaces of historical objects of culture
Modernization of unique historical objects of culture (museum and theatre complexes, concert halls, etc.) cannot be carried out by standard architecture-and-design solutions, but, despite of this, there are the most frequently used principles for arrangement of additional functional spaces: development due to concealed inner reserves, and development due to new objects.

In case of development due to concealed inner resources, there is a factual increase in the number of spaces without built-over structures or any other outer deformations of the architectural appearance; at that, however, an essential alteration of layouts and reserves is frequently observed. As a result of implementation of modern staircases, elevators and lift cages, new connection zones between the main rooms and levels come into existence [9].

The principle of development due to new objects determines two main directions. In the first case, a quite serious deformation of the initial architecture, both external and internal, gets provoked. Modernization is carried out due to building extension, heightening, and spanning over inner yards and atriums. In the second case, expansion occurs as a result of development of other existing buildings (monuments of architecture, valuable historical buildings), construction of new modern buildings which are not connected with the main building neither by design nor by layout. Some functions get transferred beyond the limits of a building. This is the most acceptable variant of transformation which does not affect the initial architectural appearance provided it is not connected with arrangement of viaducts or passageways leading to the main building [10].

Architectural-and-artistic solution of new forms can also base on various approaches to their harmonization and be carried out either in a tandem with the historical building – a nuance, or with a demonstrative conceptual change of the architectural style – a contrast [11].

The concept of a nuance intends for inclusion of new co-scale elements considering the traditional morphotype of historical buildings. The unity occurs due to harmonization of different style forms of architecture which do not disturb the whole image. It should be noted that this does not necessarily mean literally reconstituting or copying the main object, although it is based on the analogous style background [12].

When orienting on a contrast relation between the existing architecture of a building and new fragments in solution of certain elements, a contrast of proportions, scale, style, color and material is used. Such symbiosis is the most expressive one, because, first of all, it reflects artistic world perception of the contemporary epoch [13].

3. The study of development of historical objects of culture

Nowadays, the most well-known architects of the world are actively searching for new possibilities of the historical structure, which is the initial point for modernization and development of buildings. Architects take into account the whole accumulated experience, use modern materials and structures, and create memorable shapes.

Let us review development of historical objects of culture by the example of existing theatre and museum complexes.

3.1. Royal Opera House, London, Great Britain

Covent Garden Royal Opera House in London is one of the most famous ballet-and-opera theatres of the world. It is located in a presentable district of the British capital and received its name after a market called “Covent Garden” positioned nearby.

The first Theatre was built in 1732 on the place of a park that was located there. Author of the project was an architect Edward Shepherd. After a disastrous fire in 1808, it was rebuilt by Robert Smirke. But the fire didn’t spare this building as well. The third opening of the Opera House designed by Edward Middleton Barry took place in May of 1858 [14].

During the World War One, the theatre was rearranged for use as a repository, and during the World War Two it was transformed into a dance hall. It was only in 1946 when opera and ballet returned to the Theatre’s stage.
Plans of the government for redevelopment of the Theatre were revealed in 1983; that was also when an open contest was carried out, the winners of which were a team from Dixon Jones BDP (Building Design Partnership) leaded by Jeremy Dixon and Edward Jones. However, it was only in 1995 that the work on modernization and redevelopment started [15].

Redevelopment took on a big plot of land adjacent to the Theatre, and a part of the famous Covent Garden market, which allowed expanding useful area of the building while providing more space for artists and audience. The project included redevelopment of the audience hall (after reconstruction it can sit 2268 spectators, which is slightly more than before), renovation of ballet and opera classrooms, expansion of entrance halls, annexation of redeveloped neighboring buildings, and construction of additional building masses (Figure 1).

Linbury Studio, in which many experimental plays are performed nowadays, was opened at the Theatre. This is a transforming studio which can be adapted for any, even the most extravagant, director’s idea.

Floral Hall made of glass and metal was redesigned into a foyer. There are cafes, bars and restaurants, and various events and concerts are regularly held there.

Design of an overhead walkway called “The Bridge of Aspiration”, which has been designed by Chris Wilkinson and which connects the buildings of the Royal Ballet School and the Covent Garden Opera House, looks very extraordinary (Figure 2). Its dynamics seems to repeat the movement of a ballerina [16].

The architecture of new buildings next to the redeveloped classical facade looks quite contemporary though quite neutral. It complies with the surrounding buildings and does not stand out of them.

It was one of the most costly redevelopment of theatres in the world. Total cost of work amounted almost 360 million dollars.

3.2. National Opera of Lyon or the Nouvel Opera House in Lyon, France

The first opera theatre in Lyon was constructed by design of architect Jacques-Germain Soufflot and opened in 1756. However, after just several decades, the building started failing to satisfy demands of citizens and artists as it could not sit many people.

In 1826, architects Antoine Chenavard and Jean Pollet proposed to demolish the old building and construct a new one on its site. According to tradition of that time, architects decorated the main facade of the theatre with sculptures embodying Muses, the patronesses of arts. Horseshoe form of the audience hall intended for 1200 sits was adopted from traditional Italian opera houses.

In 1985, the building faced the necessity to undertake a major redevelopment. A contest was announced, upon results of which assigned for development of the project was Jean Nouvel. The process of designing lasted around five years, and reconstruction finished in 1993.
All that remained from the old building was its shell – the historical facade with sculptures, the walls and the foyer. The architect completely rearranged all inner rooms, added on underground levels for engineering equipment, and doubled the height of the building due to a semi-cylinder glass dome (Figure 3), in which rehearsal rooms for the ballet company is located [17].

Combination of the past and the present creates an absolutely special composition of the theatre’s interiors. The audience hall with six balcony tiers, which has a traditional horseshoe form, is decorated with contemporary materials which imitate metal and harmonize with open projectors of the stage lighting (Figure 4).

General height of the building, taking into account 5 underground levels which go down for 20 meters and a six-storey dome, is 62 meters, its volume about 80000 sq m [18].

At first, appearance of the theatre got strictly criticized, mainly because of its dome; but nowadays it is a part of Lyon’s architectural ensemble and has even become some kind of a symbol of the city. Today, National Opera of Lyon is traditionally called the Nouvel Opera House.

**Figure 3.** National Opera of Lyon. General appearance and top view.

**Figure 4.** National Opera of Lyon. Interior of the audience hall.

**Figure 5.** Military History Museum. Main facade.

**Figure 6.** Military History Museum. Top view after reconstruction.

### 3.3. Military History Museum of the German Armed Forces, Dresden, Germany

The Bundeswehr Museum of Military History was built in 1877 and was initially used as an armory of the Dresden military post, and in 1918 it became a museum. After Germany had been defeated in the World War Two, all military museums of the country were closed and the building had been empty and unused for a long time.

In 2001, a decision was made to carry out a cardinal reconstruction of the building. American architect Daniel Libeskind was assigned to design the project. Determined for the main topic of the central exposition was not a war but, most likely, a man in the war, no matter the epoch, time or borders. As the architect himself said, “It's not just about weapons and rockets ... it's about people's decisions and how people view the world” [19].
Classical architecture of the existing historical building, which has been constructed based on principles of strict symmetry and harmony of proportions, gets disturbed by a five-storey wedge made of glass, metal and concrete (Figure 5). Openness and transparency of the new structure contrasts with the solid facade and symbolizes the complex controversial military history of Germany. There is an observation desk located in the upper part of the wedge, which provides a panoramic view of Dresden.

A specific feature is, excursions around the exposition are conducted from the fifth floor to the ground floor. Fragments of destructed architecture get demonstrated from the top floor. Through a net-line coating, they look tragic on the background of the reconstructed city.

Interiors with expositions in history galleries are completely separated from the new exhibition spaces. Linearly arranged halls of the main building characterize the normal flow of history, but in the zone of dynamically embedded wedge their interlink gets broken, showing the preternatural effect of the war (Figure 6). What is symbolic, the alien element gets intruded into the chronologically arranged insight within the period between 1914 and 1945 [20].

The concept of broken angles, sharp edges and crushed forms in Libeskind’s architecture is a visual proof of the fact that war and criminal aggression leave a mark that never fades.

4. Summary
Results of the carried out analysis allow for some conclusions. Based on the chosen path to preserve and develop historical objects of culture, a dependency of the level, scale and quality of deformation in the initial architectural image can be observed.

As a rule, using concealed inner reserves has no effect on deformation of external architecture of facades and shapes of buildings. Historical shell of a building gets preserved though its layout structure gets changed. Such a path has limited possibilities and quickly subsides as almost every local reconstruction faces the necessity of further reconstruction after a while.

Expansion in a result of development of the existing buildings, whose design or layout are not connected with the main building, also contributes to preservation of the initial architecture as well as to simple restoration.

Deformation of historical basis is mainly caused by development due to construction of new objects. Compositional and aesthetic solutions in compatibility of new and already-existing buildings excite a special interest. It was noted that uniformity of styles is not the only correct method to create a harmonious architectural image. On the contrary, the contrast of historical and intentionally emphasized contemporary styles in one building reflects the process of development of the new epoch more vividly.

5. Conclusion
Architecture is being formed during many centuries and decades, based on conditions of time, place and the used building materials. Development of equipment and technology changes the internal and sometimes external appearance of unique architectural structures. Exploration of additional functional spaces of historical objects gives them a chance to transform and evolve, which means keeping up with the pace of the time and complying with new demands and forms of functioning.

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