

BMW Museum: A Symbol of German Contemporary High-Tech Architecture

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Abstract

The present study focuses on the impact of technology on German's contemporary architecture, concentrating on the BMW's museum construction. The researchers' approach is descriptive analytic resulting in what defines modern architecture of BMW museum as technology. In fact, studying the impact of industry on building and architecture, industrial revolution and technology and production becoming mechanical have proved the role of technology in “nature” and “form” of architecture. Applying modern technology on the construction of automobile museum buildings, Germans proved, all over the world, their scientific, political and industrial achievements as the most developed country in Europe. The form of these buildings shows new characteristics and a hormonal flexibility with industry and technology as a result of technology improvements. The changes in constructing process, manufacturing, material usage and building systems enable architecture to shape new spaces in accordance with “styles of lives”, and create desirable places to show the attitude of modern man and his achievements. In other words, man can possess a better and more profound understanding of the world by using the forms which enjoy modern technology.

Keywords: Symbol; Contemporary Architecture; Technology; Automobile Museum; Space-Time

1. Introduction

Architecture is the art of compounding the creation and production of space. In fact, architects cannot achieve their ideas without using technology. The aftermath first appeared in England and France, promoted Germany to become the most important industrial country in various fields, especially architecture. Before the World War II, the development of Germany was restricted to

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automotive industry and household appliances. The social and political institutions then supported architects in coordinating architecture and German contemporary industrial-mechanic change. The result was accelerating an effective procedure of technology on architecture. One of the most important strategies of the three advanced automobile companies of Mercedes Benz, Porsche, and BMW was investing toward providing architectural spaces, proportional to their activities and achievements. Additionally, they wanted to present a new lifestyle proportional to their industrial products which changed the personal and social modus. The aim of this research is to analyze the role of technology on German contemporary architecture by studying the high-tech architecture of BMW museum in Munich. This amazing building, in its shape, interior and exterior space, proves that the architectural design of BMW (as a symbol of German contemporary architecture) and its implementation was unachievable without using technology. The activities of Werkbund (1907), changing the idea of “time” and the sense of its unity with space, futurism and its manifesto about speed that led to a new concept of aesthetics, motivation of mobility, as well as the main philosophy of the most important art and architecture school in twentieth century, Bauhaus, about the connection between art and industry were the most effective ingredients in evolutions of contemporary architecture. Afterwards, three prominent contemporary architects, *Walter Gropius*, *Mies van der Rohe* and *Le Corbusier* founded the basis of modern architecture. Germany, the cradle of philosophy, Romantic Movement, music and science, has a long work history in changing the basis of modern thinking. Hence, this study emphasizes the importance of the role of technology in architecture including university education, the impacts of technology on the sense of the architectural spaces, constructions and exploitation of them, new technologic aesthetic experience, the connection between high-tech architecture, trade and economy, psychological effects of using technology in architecture and investigation into the cultural concept according to the technological progress of architecture in Iran. We should envision the adaptability of technology and architecture, and then benefit by technologic facilities in a direction to regulate the affairs of the Iran’s contemporary architecture.

Synoptic lists of targets are:

- Determining the importance of the role of technology in contemporary architecture
- Investigating the way of using technology in the architecture of BMW museum
- Determining the relation between human and technology in architecture
- Inspiring Iranian classes, which are related to architecture, to pay attention to German high technologic architecture in order to improve their architectural situation in the world

The following questions are posed in the present study:

- How can technologic architecture demonstrate the power and potency of a country in the world?
- How can technology be the cause of change and transformation in architecture?

This paper focuses on the role of technology in German contemporary architecture by analyzing the way of using technology in the BMW museum. Our premise is that by using technology, architecture exhibits the advanced automobile industry in Germany. This objective makes a new outlook for architectural research studies since, in modern time, alongside technology’s changes, new and various aspects and characteristics of architecture will come into view.

2. Literature Review

This paper considers the changes in the lifestyle after the industrial revolution. Hence, to be aware of the role of technology in Germany’s (as a flourishing country in the world) contemporary architecture, the focus was laid on the BMW museum; the building shows the characteristics of its

time and the capability of high-tech architecture in the creation of proportional spaces for mechanical life.

2.1. Technology and Modern Architecture

The current pace of technological development is exerting profound changes on the way people live and work (Martin & Leurent, 2017). The interrelationship between architecture and technology has a long history. It returns to the late 19th century, when emergence of new materials (i.e. metal and glass) and techniques changed the “nature” and “form” of architecture. Regarding these transformations, we can obviously understand the relationship between technological evolutions and architectural aesthetics. By considering technology as the main cause of turning Germany into an industrial power; the architecture of BMW museum shows that updated spaces could be created, if we follow the researches which focus on high development methods of using technology in architecture. The use of technology to design and build constructions with respect to their conditions and situations is considered to be an essential concept in contemporary architecture. The accurate use of technology can result in the creation of faultless and marvelous buildings (Feizi Azarshahr, Motamadny, & Basiri, 2013). Furthermore, the past twenty years have seen dramatic improvements and widespread use of IT to describe and document the work of many disciplines involved in construction projects. General purpose tools like spreadsheet and text processing software or specialized, discipline-specific tools like mechanical CAD programs or cost estimating software have also been employed (Fischer & Kunz, 2004). It seems that BMW museum architecture in the industrialized Germany conforms with the importance of technology as a factor which forms and signifies contemporary robotic architecture, a reality which is directly related to the basis of industrial revolution.

3. Changes in the Life Style of Man during Industrial Revolution

In the first few decades of the nineteenth century, the expression ‘révolution industrielle’ became firmly rooted in the French language, and although it was deployed somewhat loosely, it has a clearly recognizable meaning today, namely significant economic growth achieved through the use of new technology and machines. New technologies have indeed held a central position in interpretations of the industrial revolution for a long time. Modern architecture was born since the beginning of industrial revolution and became widespread by pioneering architects. It was established on changing human lifestyle after the period of industrial revolutions (Benevolo, 1977).

4. Improvements in Technical Construction after Industrial Revolution and Emergence of Railways

The period from 1750 to 1870 was an era of changes and architectural evolution on all fronts. Architects reflected the social ferment in both a return to the styles of past eras and a highly innovative search for means of expressing new ways of thinking and living. The 19th century is an important period because a rapid development began in architecture in the field of structures. Greenhouses, covered markets and halls, exhibition pavilions, passages and utility buildings were built of iron and steel. At that time, some people believed that the new industrial civilization would give birth to new architectural forms. They had high hopes of the newly introduced materials like cast and wrought iron, glass and concrete (Gyvetvai-Balogh, 2007).

5. The Emergence of Industrial Fairs and New Buildings

The rapid development of modern cities can be attributed to new technologies in building construction, urbanization and the need to change the urban cape of the city; the ever changing needs of the society and persisting environmental problems have also necessitated the emergence of new cities all over the world. Thus, architecture plays a pivotal role in the design and implementation of modern cities and towns. The impact of industrial revolution gave rise to new materials to be used by the architects of the 20th century, namely reinforced concrete, steel and glass. These new materials were inexpensive, mass produced and flexible to use, thereby serving as the main building components. Technology transformed architecture into a tool for social and cultural reform. The need to redevelop the urban landscape profoundly affected major cities in the world by allowing greater density through higher buildings. Modern technology began to influence the cities by the end of the World War I in 1918. Within this period, architecture began to evolve and some notable scholars developed their style of architecture thus experimenting new technology in materials and techniques (Raji, 2013). The aftermath of these fundamental changes was the appearance of new buildings and powerful countries and in modern cities like Paris. Additionally, one of the consequences of capitalism was a transformation in the production, marketing and reception of iconic architecture (Sklair, 2005). These buildings were the effects of flourishing industry and economy, i.e., skyscrapers, railway stations, airports, bridges, stadiums, residential and commercial buildings, superhighways and world industrial fairs which were large, in open air and temporary (Benevolo, 1977).

6. Glass in Modern Architecture: An Industrial Material in Crystal Palace (1851)

Glass performs a significant function in space divisions, heat and light control. It has been present since ancient times and hence fully justifies being considered as a traditional material in some countries. Glass however was expensive and so enjoyed only restricted use up to the nineteenth century. Mass production of sheet glass, the development of steel frames, cable structures, fixing devices and systems as well as elastic and elasto-plastic sealant changed this and resulted in a number of innovative solutions and systems (Raji, 2013).

6.1. Crystal Palace

In the nineteenth century, horticulturists such as John Claudius Loudon and Joseph Paxton, aware of the new environmental possibilities of glasshouses that had been demonstrated in the context of horticulture, contemplated the use of fully-glazed structures as a means to create new types of environments for human beings (Schoenefeldt, 2008). Paxton' design was based on a 10in x 49in module, the size of the largest glass sheet available at the time. The modular system consisted of right-angled triangles, mirrored and multiplied, supported by a grid of cast iron beams and pillars. These basic units were extremely light and strong and were extended to an incredible length of 564 meters (Merin, 2013). The crystal Palace, as an exhibition hall, is still considered as one of the great icons of lightweight, modular and transparent architecture, making use of mass production processes for iron and glass (Klassen, 2004).

7. Metal and Modern Era

At the end of the eighteenth century, iron entered in large scale buildings, being considered as the first new material since pre-history. By the 1850s, a comprehensive set of ideas for the use of

metals in construction were developed, invented, debated and tested for all parts of habitable structures (Guedes, 2010, p. ii). Iron (both cast and wrought) has long been utilized in building but steel was introduced only in the course of the second half of the nineteenth century. Its introduction gave rise to the construction of tall structures (like skyscrapers and towers) and long-span structures in the form of bridges and spaces covered by domes, shells and space trusses. It has been used in all sorts of standard buildings as well as industrial halls, agricultural buildings, commercial malls, military base, and hangers in airports (Raji, 2013).

7.1. Paris World Exhibition (1889)

This exhibition marked the centenary of the French Revolution, and its most famous structure was the Eiffel Tower. An equally spectacular construction in cast iron was the Palais des machines, which covered 77,000 square meters, and cost seven times as much as the Tower. It contained a gallery of machinery, and side galleries devoted to the arts, as well as national displays. Around the tower was a park with restaurants and some national pavilions, with more national pavilions along the river-side. The colonial exhibition on the Invalides esplanade was popular. Electric lighting enabled the park to be visited in the evenings. A huge Palais de l'Industrie on the Champs Elysées was demolished only in 1910[†] (Daniels, 2013).

8. Futurism and Distresses of Modern Architecture

From an architectural standpoint, futurism was characterized by the absorption of a set of drawings and proposal elaborated, for the most part, by Antonio Sant'Elia, in Italy, between 1912 and 1914. The futurist movement was one of the cultural excitements intended to reach all areas of artistic production. The premises of this artistic subversion were enunciated through the various manifestos, which established their ground based on the futurist ideal. In broad terms, the common ground shared by these manifestos is expressed in the following predispositions:

- Destroy adoration of the past, obsession with the antique, academic arrogance and formalism.
- Exalt technology and the machine. Seek out the beauty of speed.
- Drive artistic thematics to the city. The new city is thought of as a machine in a movement.
- Reinforce the original behavior based on daring, courage and rebellion as essential elements of artistic transformation (Talor, 1927).

9. Impressive Considerations related to German's Art Achievement

9.1. Peter Behrens

In architecture, he was a newcomer. A milestone in Behrens's career, as well as in the history of German art, was his connection with Emil Rathenau's AEG (General Electricity Company), which was the biggest industrial concern in Germany around 1910. In 1907, the industrialist and the designer began a partnership that was unique at that time.

[†] Refer to: (Geppert, Jean Coffey, & Lau, 2006)

9.2. Werkbund

For years, one of Germany's foremost cultural organizations, the Werkbund included in its membership such pioneers of the modern movement as Henry van de Velde, Hermann Muthesius, Walter Gropius, and Mies van der Rohe. The Werkbund set out to prove that organized effort could revitalize the applied arts and architecture. In addition to acting as an agent of reform, it provided a forum for the debate of such broad concerns as the need to restore joy and dignity to work in modern industry (Campbell, 2015).

9.3. The Bauhaus and Walter Gropius

During World War I, Gropius served as an officer in the Western Front. Once the war was finished he took the direction of the Grand-Ducal Saxon School of Arts and Crafts in Weimar, which he renamed the Staatliches Bauhaus Weimar. He gave shape to the new theory, organization and curriculum for the school, which quickly gain international recognition. Gropius' plan for the Bauhaus was to bring together arts and crafts and to make this union appropriate for a close cooperation between these and the industry. Arts and crafts should work together with the ultimate aim of bringing about an architecture that would represent the spirit of the time, something that was, according to Gropius, not being done by the contemporary architects and the traditional art academies (Savio, 2006).

10. Toward New Forms: Synchronic Integrating of up-to-date Technology and Formal Solutions via High-Tech Architecture

First of all, inductively, we have to think what architecture could achieve in order to improve human civilization of the future, and create environments which are conducive to legitimate human needs and aspiration (Nagashima, 1995). It should be said that the introduction of new technologies shortens the life cycle of products. Furthermore, innovations in the production process reduce production costs and prices. The latter effect is strengthened by competition in every fields (such as a focus on automobile museum: Industry and architecture) (Hart, Huisman, Kort, & Plasmans, 2006), for example, the Building Automation Systems (BAS) which provide automatic control of the conditions of indoor environments. The historical root and still core domain of BAS is the automation of heating, ventilation and air-conditioning systems in large functional buildings (Kastner, Neugschwandtner, Soucek, & Newman, 2005). Therefore, high tech architecture (as in BMW museum) influenced by high tech industry contains all of the processes of architectural design. High tech buildings are the exhibitions of technical and scientific progress, modern industrial achievements, building process, movement, structure and details.

10.1. Centre Georges Pompidou

The concept, depicted in one of the competition drawings as a collage, portrays the museum itself as a movement. The other concept in its design, and perhaps the most obvious one, exposes the entire infrastructure of the building. The skeleton itself engulfs the building from its exterior, showing all of the different mechanical and structure systems not only to be well understood but also to maximize the interior space without interruptions. The different systems on the exterior of the building are painted different colors to distinguish their different roles. The structure and the largest ventilation components were painted white; the stairs and elevator structures were painted a silver gray; ventilation was painted blue; the plumbing and fire control piping was painted

green; the electrical elements were yellow and orange, and the elevator motor rooms and shafts, or the elements that allowed for movement throughout the building, were painted red. One of the "movement" elements that the center is most known for is the escalator on the west facade, a tube that zigzags up to the top of the building providing visitors with an astonishing view of the city of Paris. The flat open site upon which it is located is a constant exterior stage for urban events (Perez, 2010).

10.2. Myzeil Shopping Center (Frankfurt)

The sculptural glass facade of Myzeil creates impressive and dynamic spaces within the public atriums, creating a unique environment for a common activity. The design is inspired by geography and topography. The facade is conceived as a river that has different depths reaching into the earth. The structure is inspired by the historical context of the site. The fluid shape comes from the connection of the Myzeil, the shopping boulevard in the heart of Frankfurt, and the Thurn and Taxis palace. The two facades on opposite ends of the building are designed to evoke the two distinct senses of the city. The historic-facing facade maintains a formal appearance. On the side of the Myzeil, the building has an internalizing quality. The facade challenges the exterior-interior distinction with a void that is pulled into the atrium of the mall, looking very much like a vortex. The facade is designed with alternating panels of the glass and steel. Mostly transparent, it floods all levels of the mall with natural sunlight. The shopping mall is spread over six floors and includes a square and meeting place that also has a fitness area and restaurants. It is an interior public plaza that is absorbed into the program of the building (Vinnitskaya, 2012).

11. The Analysis of Automobile Museums according to the Role of Technology on their Architecture

Robert Venturi in his book, 'Complexity and Contradiction in Architecture' explains that challenging the observer actually enhances his/her experience with the architecture because the work becomes "more vivid." He talks about "complex architecture" as a "both-and" scenario (rather than strictly "either-or," which is not inclusive). "Both-and" architecture promotes hierarchy within it, which leads to contrasts, layers and levels of meanings (Venturi, 1977). The BMW museum as a symbolic building which contains contemporary paradigms of new technological world gets the visitors into the critical thought (Pollock & Zemans, 2007). Additionally, one of the ways in which contemporary museums are attempting to challenge dominant views of museum as a site of power relations is to invoke and encourage new relations between museum and communities. As a movement, this phenomenon can be broadly defined as the "New Museology" (Witcomb, 2007). The BMW museum established communication with other countries by using up-to-date technology, modern architecture, and most advanced German industry (like automobile). German's automobile museums are symbols of their industrial and architectural power. Since 2000, car manufacturing industry has increasingly turned towards spectacular and expressionistic architectures, targeting the confirmed presence in global and local (i.e. at city level) public space. This also resulted in the opening to the general public of extensive surfaces of interactive and museum spaces to accommodate educational-informative activities present the historic and technological emblem or host cultural events and interactive functions. In the area of automotive architecture stands out a boom in projects and constructions which are becoming more and more specialized to meet the new changes in the private life as well as in the life of society and the standard of living prefigured for the 21st century (Mihaila & Banica, 2014).

12. BMW Museum

12.1. Introduction to BMW Museum and its Theatrical Basis

BMW Company has been a symbol of dynamism in driving experience and pioneer of innovation in both fields of design and technology. BMW museum was opened in 2007 and today the exhibition and discovery center is now at the very heart of the BMW brand's operations. The Museum's building is remarkably amazing, not only depicting the architectural expressions but also presenting the qualifications of life and architecture in the future. The exhibition is directed at a broad-ranging target group and presents architectural models, large-size photos and pictures, building plans and graphic representations of the world's most modern museum buildings. The exhibits comprise a wide-ranging and diversified synopsis of modern museum architecture. The exhibition views museum as a universal phenomenon, whilst at the same time intentionally preserving each architect's distinctive signature, this being expressed in the composition of models, photos and pictures, building plans and graphic representations (Morris, 2010).



Fig 1 Exterior view to the BMW Welt Munich, Germany (Source: <https://www.e-architect.co.uk>)

The (BMW Welt) building is integrated into a green park area opposite the Olympia Park Stadium, and connected to it via a pedestrian bridge. This footbridge continues inside the building as the main promenade and observation sight of the architectural space, purposefully designed in a dynamic-fluid-flowing manner. The interior is a large all-under-one-roof open space - publicly and freely accessible, to traverse at either ground plaza or at the above bridge level. As the figures illustrate, BMW Welt develops an area of 73,000 square meters with a corresponding volume of 531,000 cubic meters on a plot of 25,000 m² (Käs & Konrad, 2016).

12.2. Form and Abstraction

Designed iconic, representative and purposefully large, BMW Welt surprises its dynamic and nuanced architecture and an extensively sought expressiveness. The double-cone is the attraction and the recognizable element, purposefully designed by the architects. This key element, by its dual rotation, suggests the creation of an epicenter in space fluidization.

BMW Museum - Munich reopened in 2008 signed by Atelier Bruckner who added the road concept in the rebuilt space to the former museum building designed by Prof. Karl Schwanzer. Similar to BMW Welt, the new redesigned museum is part of the same idea of the developer to communicate with the wide public, and to exhibit its collections and experiences. The museum was

conceived as a landmark, making a discrete but noticeable presence in the urban space - with its unmistakable concrete mushroom-cone sculptural volume. The museum accommodates permanent collections and fully illustrates the BMW experience through the years, on categories ranging from aircrafts to cars and motorcycles. It also hosts an innovative area showing new conceptual and preproduction models. The exhibition concept is structured around seven thematic blocks - 'seven houses' of:

- Design
- The Company
- Motorcycle
- Technology
- Motor Sport
- Brand, Series - each with corresponding thematic exhibits (Mihaila & Banica, 2014)



Fig 2 BMW Welt Munich, Germany. View from bridge to the museum (Source <https://www.bmw-welt.com>)

12.3. Structure and Materials

BMW has been constructed by high quality performance concrete prepared with cement, mineral and chemical additives polymers, silica fume, granulated blast furnace slag, and high-reactivity Meta kaolin, reinforced with fibers instead of steel rods. The high-performance concrete examples are high-rise buildings. New developments in concrete are concrete with resins and concrete with fiber-reinforced polymer (FRP) reinforcement (Raji, 2013). By using metallic and composite (i.e. concrete and metal), the concept of BMW museum came to existence (Mihaila & Banica, 2014).

12.4. Texture: Urban Characteristics and Possibilities

Both BMW Museum and BMW Welt participate in city life by hosting various cultural events like festivals, concerts, carnivals and parties for kids, for the general interested public. The footbridge crossing towards BMW Welt has been positioned right in front of the BMW Museum entry, the visitor being allowed for a complete tour of BMW urban facilities and also being able to continue with Olympia Stadium Park. The activities and hosted events are well integrated and quite similar to those of BMW Welt (Mihaila & Banica, 2014).

12.5. Inner Space Necessities

The original concept for the BMW Museum was based on an idea by the architect Professor Karl Schwanzer. He defined the inner structure of the round building as a continuation of the road in an enclosed space. This notion of a “road in an enclosed space as the principle of dynamic architecture” was further developed in a modern and contemporary way for the adjacent low building. Using a similar structure to that of the round building, where platforms are placed like plazas along a road, the exhibition areas in the neighboring low building are organized along a ramp that forms the central visitor route. However, the architectural elements, ramps and exhibition halls create a much more dynamic overall impression. Seven exhibition halls were built in the low building, each of which has its own identity based on a particular theme (Käs & Konrad, 2016). The concept of innovation is what structures the type of exposure and spatial experiment, bringing the technology to the level of perception as progressive design. The space separating walls are simultaneously lighting elements, information screens, displays for keywords and automotive conceptual design sketches contributing to the complete and comprehensive image regarding the historical evolution of collections. The interior conical volume is designated to the developing technology, car prototypes and the enunciation of concepts in progress. The main activities are:

- Automobile delivery center
- A technological display section
- The public being able to participate and experience the defining BMW technological universe through exhibits like complex finishing textures and materials, types of engines along with the extensive presentation of solutions related to energy efficient design and dynamics
- A substantial showroom area displaying the latest car models
- An interior shop selling multiple brand design products ranging from high performance bicycles to Nano-textures clothing
- A restaurant and a bookstore
- Event Forum: rooms and spaces like auditorium, conference rooms and other facilities with connected services (Mihaila & Banica, 2014)



Fig 3 Interior design of BMW museum: coordination of human and automobile in the space (Source: <https://www.world-architects.com>)

12.6. The Coordination of Space and Automobile: The Priority of Design

The main goal of architecture in the BMW Company is creating spaces appropriate for its high technological products. For example, the visitors can experience just how electrifying driving pleasure will be in the future. The exhibition showcases the BMW i concept vehicles and series production models and the revolutionary Life Drive Modules – the first automobile architecture specifically designed for electric automobiles. At BMW Welt, people can find out all you need to know about electro-mobility and see how BMW is revolutionizing the automobile industry through the use of carbon and natural materials in the vehicle's interior. As such, designing the space changes especially according to automobile development and museum exhibits this revolution. Additionally, museum involves the origins of BMW M which lie in the BMW brand. The BMW M exhibition is in the north wing of the building. Dark asphalt, tyre stacks, starting lights and curbs create a race track atmosphere for visitors to showcase the M GmbH's pedigree. The five cube-shaped rooms enable visitors to discover first hand just how sustainable business works, for example, by using the Efficient-Dynamics pinball machine (Käs & Konrad, 2016).

12.7. Physical Behaviors: Stimulus Intellects and Reactions Related to Movements

Visionary vehicle concepts and mobility services, inspiring designs and a long-term commitment to the environment are helping to redefine our understanding of personal mobility. BMW i shows just what can be achieved. Visitor's heart skips a beat, he/she feels a surge of adrenalin, the go-kart feeling kicks in and he/she forgets about everything else. MINI inspires passion – it's an unconventional brand, full of great ideas and zest for human life (Käs & Konrad, 2016).



Fig 4 BMW Welt Munich, Germany, Architecture as a connection between human and technology (Source: <http://www.travels-in-germany.com>)

12.8. BMW Museum and Pop Art

You pass the entrance, and then you will face a different exhibition i.e., Pop Art. There are some of the paintings that belong to the pop art proxies: Andy Warhol and Roy Lichtenstein. But why? What is the relationship between pop art and BMW museum? First, we should refer to the

environment in which pop art flourished. With the end of World War II, the United States became the undisputed leader of the western world. As the major industrial powers of Europe –England, France, Germany and Italy – were busy rebuilding their infrastructure, American Industry was churning out goods at a fast pace (Justiniano, 2011). Now Germany has a high level of technologic power in the world. BMW museum as a symbol of German contemporary technologic architecture; it is not only a museum for the exhibition of automobile, but also it could be a place for the exhibition of other industrialized forms of art. BMW Company, by using up-to-date technology in the architecture of its museum, makes this building a house for modern contemporary art. In fact, an industrialized product (e.g., automobile or canned beans) allocated art field for exhibition of spirit of the time. Consumer goods, industrial production and its direct relation to realities of routine activities, link the BMW museum with pop art. Therefore, Multi-functional and flexible spaces in BMW museum are appropriate for exhibition of contemporary art. American pop art is one of them.

13. Conclusion and Suggestions

Automotive architecture evolved and changed, especially in the area of car museums. The field of architectural practice and management has responded with built products which offer the users public spaces inside interactive buildings, museums and places of events-activities. The automotive companies have imprinted their insertions with a branded technological mark, acting as key urban developers, promoting innovative architectures and having significant investments at city or regional level. The museums become part of the innovation system. The studied automotive BMW museum go beyond the usual capacity to show historical tendencies and development by showing and exploring current and future tendencies not only in the automotive industry but also in the fields of architecture, urban management and last but not least in the area of the cultural phenomenon. The BMW museum profile successfully adds a time dimension with reflections towards past, present and future, by explicitly showing the resilience and adaptation of the automotive industry. Secondly, the study of the museum shows that car manufacturers compete not only in terms of car sales and performance, but also as city builders and developers, or urban cultural promoters and managers (Mihaila & Banica, 2014). High-tech architecture of BMW museum emphasizes its undeniably important role in German contemporary architecture. Looking back to Iran's contemporary architecture, it seems that understanding the role of technology and its utilization needs a major revision. This point also applies to the field of architectural education, redefinition of the connection between identity of architecture and technology, architects' intellectual transformation proportional to the industrial development, process of construction, changes occurring in human environments, effects of technology on macroeconomy, and psychological effects of architecture on international communication. It seems that architecture, in Iran, should change regarding technological achievements related to the architectural processes of design.

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