New Perspectives in Automotive Industry Architecture: Car Museum Design

Subject Review
UDC 727.7"00"
Fig. 1. BMW Welt Munich, Germany: view from BMW Museum, photo 2008

Sl. 1. BMW Welt, München, Njemačka: pogled iz BMW muzeja, snimljeno 2008.
NEW PERSPECTIVES IN AUTOMOTIVE INDUSTRY ARCHITECTURE: CAR MUSEUM DESIGN

NOVE PERSPEKTIVE U ARHITEKTURI AUTOMOBILSKE INDUSTRIJE: PROJEKTIRANJE MUZEJA AUTOMOBILA

Since 2000, car manufacturing industry turned increasingly towards spectacular and expressionistic architectures, targeting the confirmed presence in global and local (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.

CAR MUSEUM
CULTURAL SPACE
DESIGN
INNOVATION
TECHNOLOGY

MUZEJ AUTOMOBILA
KULTURNI PROSTOR
PROJEKTIRANJE
INOVACIJA
TEHNOLOGIJA

Od 2000. godine automobiljska se industrija sve više okreće spektakularnoj i ekspresivnoj arhitekturi, potvrđujući svoju prisutnost u globalnom i lokalnom javnom prostoru. To je dovelo do otvaranja velikih površina interaktivnih muzejskih prostora koji su u sklopu javnog prostora, koji su namenjeni obrazovno-informativnim aktivnostima, predstavljanju istorijskog i tehnološkog emblema ili organizaciji kulturnih događaja i interaktivnih funkcija.

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INTRODUCTION AND GENERAL THEORETICAL FRAMEWORK

UVOD I OPCI TEORIJSKI OKVIR

If 1980’s launched along with Renault Distribution Centre in Swindon, UK, 1980-1982 2 signed by the architect Norman Foster – a new fashion in the architectural program dedicated to the exhibit and the car sales business, this was only the beginning of a new trend in promoting the brand space of the car manufacturing industry. This trend is orientated, at the time, towards the technologically-innovative expressiveness of architecture, careful selection of the architect and the enounced architectural concept, the presence in a particularly chosen landscape to enhance the image of innovative design, extensive areas (25,000 m²) and the functional diversification of the exhibition and sales programmes with other types of activities in the category of events and leisure. All these characteristics were intended to make the location a point of local and global attraction. Renault Distribution Centre Building was making then a change of thinking in the plane of industrial distribution area, re-dedicating a large surface of deployment and a spectacular iconic architecture. It was also making a shift in rethinking the function dedicated to the commercial showroom and the industrial area 3 – marking the emergence of a new architectural programme, hybrid at that time: the automotive centre as a point of attraction and global architectural expression.

Years 2000 mark at all levels of architecture a relaxation of design towards the search of manifests and the structural expressiveness of the image, and the stability in the favour of redefinition of technology. 4 In the area of automotive architecture 5 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. Architecture dedicated to automobiles 6 covers since the years 2000 several programmes: from the architecture of highways, crossings and bridges, facilities for Formula 1 racing and test tracks, car stations and gas stations, acoustic barriers and parking sites, showrooms and sales and leisure centres, dealerships, factories, up to dedicated innovative research centres and museums. Illustrative examples in this regard are: Trees Acoustic Barrier Az Motorway in 2009 (by Structurae) 7, Chiasso, Switzerland (by Mario Botta), Audi Forum Museum Mobile 8 in 2000, Ingolstadt, Germany (by Henk Architecten), Park and Ride Tram Station 9, in Strasbourg France (by Zaha Hadid), BMW Central Building Factory 10 in 2005, Leipzig Germany again by Zaha Hadid 11, Citroen Flagship Showroom 12 in 2007, Paris France (by Manuelle Gautrand), Dubai Autodrome 13 in 2004, Dubai UAE (Populous), Ferrari Research Centre 14 in 2012, Modena Italia (Shiro Studio), New Ferrari Headquarters 15 in 2004, Maranello Italia (Massimiliano and Doriana Fuksas), Lingotto Factory Conversion 16 in 2002, Torino Italia (Renzo Piano), Mercedes Benz Museum 17 in 2006, Stuttgart Ger-

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1 This article is part of the post-doctoral research project “Types of innovation in cultural space. [working with/ in] cultural spaces _ tradition and innovation.” PI Dr. Architect Marina Mihaila, and it is supported by a grant from the Ministry of Education in Romania, CNCS-UEFISCDI, project no. PN-II-RU-PD 2012-3-0535.
3 DREDDY, 2007
4 MIHAILA, 2012
5 JODIDIO, 2011
6 MORRISON, MINNIS, 2012
11 HADID, GANNON, 2006
many (UnStudio), Hessing Cockpit Building and Acoustic Barrier\textsuperscript{28} in 2005, Utrecht Holland (by ONL), Renault Square Com in 2004, in Boulogne-Billancourt França (by Jakob MacFarlane), Rolls Royce Manufacturing Plant and Hq\textsuperscript{29} in 2003, West Sussex UK (by Nicholas Grimshaw), Central Bus Terminal\textsuperscript{20} in 2002 Lugano, Itàlia (Mario Botta), Shanghai Auto Museum\textsuperscript{30} in 2007, Shanghai Automobile City China (Atelier Bruckner), Three Bridges\textsuperscript{22,31} in opening towards the city space and tourism in Boulogne-Billancourt Frant’a (by Jakob MacLand (by ONL), Renault Square Com in 2004, and Hq\textsuperscript{19} in 2003, West Sussex UK (by Nicholas Grimshaw), Central Bus Terminal\textsuperscript{20} in 2002 Lugano, Itàlia (Mario Botta), Shanghai Auto Museum\textsuperscript{30} in 2007, Shanghai Automobile City China (Atelier Bruckner), Three Bridges\textsuperscript{22,31} in opening towards the city space and tourism in Boulogne-Billancourt Frant’a (by Jakob MacLand (by ONL), Renault Square Com in 2004, and Hq\textsuperscript{19} in 2003, West Sussex UK (by Nicholas Grimshaw), Central Bus Terminal\textsuperscript{20} in 2002 Lugano, Itàlia (Mario Botta), Shanghai Auto Museum\textsuperscript{30} in 2007, Shanghai Automobile City China (Atelier Bruckner), Three Bridges\textsuperscript{22,31} in opening towards the city space and tourism in Boulogne-Billancourt Frant’a (by Jakob MacLand (by ONL), Renault Square Com in 2004, and Hq\textsuperscript{19} in 2003, West Sussex UK (by Nicholas Grimshaw), Central Bus Terminal\textsuperscript{20} in 2002 Lugano, Itàlia (Mario Botta), Shanghai Auto Museum\textsuperscript{30} in 2007, Shanghai Automobile City China (Atelier Bruckner), Three Bridges\textsuperscript{22,31} in opening towards the city space and tourism in Boulogne-Billancourt Frant’a (by Jakob MacLand (by ONL), Renault Square Com in 2004, and Hq\textsuperscript{19} in 2003, West Sussex UK (by Nicholas Grimshaw), Central Bus Terminal\textsuperscript{20} in 2002 Lugano, Itàlia (Mario Botta), Shanghai Auto Museum\textsuperscript{30} in 2007, Shanghai Automobile City China (Atelier Bruckner), Three Bridges\textsuperscript{22,31} in opening towards the city space and tourism in Boulogne-Billancourt Frant’a (by Jakob MacLand (by ONL), Renault Square Com in 2004, and Hq\textsuperscript{19} in 2003, West Sussex UK (by Nicholas Grimshaw), Central Bus Terminal\textsuperscript{20} in 2002 Lugano, Itàlia (Mario Botta), Shanghai Auto Museum\textsuperscript{30} in 2007, Shanghai Automobile City China (Atelier Bruckner), Three Bridges\textsuperscript{22,31} in opening towards

The museums dedicated to cars\textsuperscript{26} follow the tradition of spaces destined to exhibit objects\textsuperscript{27} of museal value\textsuperscript{28}, both permanent as well as temporary collections complementary or not to the thematic area. This a niche of innovation at the level of the architectural programme integrates one or more facilities specific for the automotive industry, translating concepts from the automotive area into specific architectural elements in the forms of street design, movement, dynamics of perception and so on, but also incorporates the innovative and technological history of the 21st century.\textsuperscript{29} Likewise, the new car museum addresses a wide audience in the same way as the contemporary museum\textsuperscript{30} does it, by opening towards the city space and tourism\textsuperscript{31}

When does occur the mutation taken by the museum\textsuperscript{35} towards the area of automotive-cars exhibits and the illustration of the history as the domain’s evolution and current state of the art? We might probably state that starting with the years 2000 the car manufacturing industry increasingly turned towards more spectacular and expressionistic architectures, targeting directly the confirmed presence in the global and local (at city level) public space, but also at the level of opening to the general public extensive surfaces of interactive and museum spaces to accommodate educational-informative activities, the historic and technological emblem as well as events and interactive functions.

**MATERIALS AND METHODS**

**MATERIJALI I METODE**

The article is built around four selected case studies which investigate and highlight essential underlying data, illustrated with documentary photographs taken during study trips. In addition to the field research undertaken by the authors, specialty materials regarding the architecture and management of studied projects are the main sources of information. The followed method is a multicriteria comparison of the case studies on several levels of analysis concerning both the architecture and the management of the studied examples. The four case studies were analyzed comparatively departing from the synthetic figures related to architecture, urban space, managerial and statistics of touristic attractiveness\textsuperscript{36}, synthetic study on architectural management – tourism management\textsuperscript{37}, targets and results, brief study

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\textsuperscript{17} http://www.mercedes-benz-classic.com/content/classic/mpc/mpc_classic_website/en/mpc_home/mbc.flash.skipintro.html#_int_mbc:home:home-link:mbc [1.6.2014.]
\textsuperscript{19} http://grishaw-architects.com/project/rolls-royce-manufacturing-plant-headquarters/ [1.6.2014.]
\textsuperscript{20} http://www.botta.ch/page/Projekte/automotive-centre-excellence [1.6.2014.]
\textsuperscript{24} http://www.phaidonatlas.com/building/automotive-centre-excellence [1.6.2014.]
\textsuperscript{25} http://www.phaidonatlas.com/building/car-park-st-veit/ [1.6.2014.]
\textsuperscript{26} MEYHÖFER, 2003
\textsuperscript{27} MARVIN, 2013
\textsuperscript{28} NAREDI-RAINER, HILGER, 2004
\textsuperscript{29} BETTSTEIN-KIESER, 2008
\textsuperscript{30} TOY, 1997
\textsuperscript{31} LASANSKY, McLAREN, 2004
\textsuperscript{32} CARMONA, et al., 2009
\textsuperscript{33} GEHL, 2010
\textsuperscript{34} HOMADOVSKI et al., 2009: 395
\textsuperscript{35} JODIDIO, 2010
\textsuperscript{36} GALI-ESPULT, 2012
\textsuperscript{37} RUSSO, VAN DER BORG, 2002
regarding innovation in architectural design, solutions of enveloping, structure and dedicated spaces. Table I and Table II present this data which is intended to give a simultaneous comparative overview of the four projects: BMW Welt – BMW Museum Munich, Porsche Museum Stuttgart, Mercedes Benz Stuttgart, Audi Museum Ingolstadt.

All studied objectives have been built in the first decade of years 2000 in Germany. The motivation in choosing the case studies has been based on several criteria: the impact and influence the automotive industry has had in the region of south of Germany (but also in Central Europe) and in the generation of gross domestic product (the respective Länder) over time; the localization in a relative proximity; the close year of construction; all chosen brands are German; a similar architectural mission to create relevant technological-architectural attraction points both at urban and regional levels; a change in public perception regarding the facilities the car manufacturing industry is offering and their impact on the local quality of life; the transformation and expansion of the manufacturing plants through additional spectacular features; the cultivation of a lifestyle that is based on design preference, relaxation and creativity; the re-transcription of brand influence and presence in the city, by rewriting the landscape information.

Materials and literature underlying the study are: books dedicated to each of the museums; books theorizing the new museum architecture or the relationship between architecture and automobiles; industry trends and concepts; studies of the authors; information from the official websites of museums, architectural and online articles on architecture and tourism including official press-releases and attached materials; documentary photos by authors taken during study trips.

DISCUSSIONS ON CASE STUDIES
AND RESULTS

DISKUSIJE O PRIMJERIMA
I REZULTATI

The case study discussions are situated between the field of vanguard architectural design and the industry’s approach regarding its opening to the wide public space and audience, as well as the reconsideration of the involvement of the car industry into the softer area of art and culture. The relevance of the brand impact in architectural configuration and the connection with particular names from the architecture world are considered important and an intrinsic part of the car museum development technology.

CASE STUDY 1 – BMW WELT AND BMW MUSEUM, MUNICH

BMW Welt – Munich, opened in 2007, is the newest building built in fact as an extension of the architectural park developed by BMW Group AG in Munich alongside BMW Werk (BMW Factory), the office tower connected to the factory, and the BMW Museum (initially established in 1973). BMW Welt is the work of Coop Himmelblau architects from Austria, who won the 275 entries architectural competition from 2001, subsequently completing the full architectural design. As a key landmark of urban representation, BMW centre was conceived as a visual insertion between the initial BMW development and Olympia Stadium, but also as an additional value to the experience of the organized factory and museum visitation tours (which already attracted a significant number of visitors). At the level of activities and representation it was intended as a large brand experience open space that would generate a new identity and architectural spatial formation of the whole ensemble.

The (BMW Welt) building is developed integrated into a green park area opposite to the Olympia Park Stadium, and connected to the later via a pedestrian bridge. These precedent may be the reason why Coop Himmelblau included in their architectural concept strategy the connection to the site previously developed by BMW Werk via a bridge-like pedestrian walkway, spanning across the street (Fig. 1), which also becomes the main feature – architectural-axis of the new building. This footbridge continues inside the building as the main promenade and observation point 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, possibly to traverse at either ground plaza or at the above bridge level. The continuity of the promenade routes connecting first the BMW Werk development to the BMW Welt building via the pedestrian bridge – and then the existing bridge crossing over to the Olympia Park Stadium (Fig. 2), ensure an efficiently studied spatial coherence.

From the perspective of figures 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 (Table II). The main activities are: automobile delivery centre (where customers from around the world now come to pick up their car directly from the centre in Munich), and a museal technological display section. The later includes a permanent collection of technological information presented though live exhibits or via interactive displays and real-time simulations. The public is 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. The building also provides 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. The experience is completed through a restaurant and a bookstore that shows BMW buildings but also includes topics like design, architecture and art. Under the heading ‘Event Forum’ the complex also provides rooms and spaces like auditorium, conference rooms and other facilities with connected services able to accommodate and fully service a significant number of events or happenings like meetings, conferences or filming events.

Desired iconic, representative and purposefully large, BMW Welt surprises with its dynamic and nuanced architecture and an extensively sought expressiveness. Despite its considerable scale it manages to avoid being aggressive in relation to the site also with the help of its wisely designed envelope with no single part or texture uncorrelated with the context. The double-cone is the attraction and the recognizable element, purposefully designed so by the architects. This key element, by its dual rotation, suggests the creation of an epicentre in space fluidization.

BMW Museum – Munich reopened in 2008 signed by Atelier Bruckner who have added the concept “road in the rebuilt space” to the former museum building designed by Prof. Karl Schwanzier in 1973 under the motto “streets and places in urban space”. Similar to BMW Welt, the new redesigned museum is part of the same idea of the developer to communicate with the wide public, to exhibit its collections and experience, but also to experiment new types of interactive spaces. The architectural project is the result of the award of the 2001, 170 entries architectural competition. 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 (Fig. 2). The museum accommodates permanent collections and illustrates fully 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 pre-production 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.

The contemporary museum model is illustrated here by Atelier Bruckner through paths and open-plaza surfaces, where the multilevel crossings allow for a dynamic and correlated perception over the interior spatial organization.

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 (design in progress). 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 display area totals 5,000 square meters and 120 exhibits (Table II). The museum, accessible only with a ticket, hosts a cafe and a bookstore (and small design objects). 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 but also able to continue with Olympia Stadium Park. The activities and hosted events are well integrated and quite similar to those of BMW Welt.

Both BMW Museum and BMW Welt participate in city life by hosting various cultural events like festivals, concerts, carnivals and parties for kids, various events for the general or dedicated public (at the date of writing the article in BMW Welt: CRIME FICTION Film Festival). It is important to underline that the synergy between the two objectives led to a substantial growth in the number of visitors of the BMW ensemble (see Table II for exact figures).

CASE STUDY 2 – PORSCHE MUSEUM, STUTTGART

The opening of the Porsche Museum (Por- sche AG, 2014b) in Stuttgart took place in early 2009, just few weeks after the completion of construction (in December 2008). The
museum features a spectacular collection based on the innovation and the experience of its creator Ferry Porsche (who is in fact of Austrian origin).

"The Porsche Museum creates a space that gives architectural expression to the company’s confident outlook and discerning standards, while also capturing Porsche’s dynamism. Knowledge, credibility and determination are as fundamental to the philosophy as courage, excitement, power and independence. Every idea is treated as an opportunity actively to tackle fresh challenges and probe the limits, yet still remain true to yourself. This museum endeavours to reflect all that" - declares architect Delugan Meissl in his dedication.48

Developed on an urban island across the main Porsche car delivery centre and showroom, Porsche Museum building predicates the design brand statement through innovative technology architecture, structural autonomy and particular presence in the image of public space. But as a fundamentally cultural urban insertion (Fig. 3) it also becomes part of the urban revival process49, of the urban revival of a predominantly industrial district. The suspended volume which houses the exhibition space flows above an exterior public space (included in the design since competition stage in 2002-2004). The public space works like an agora or an exterior (covered) public square a needed respiro in its ponderosity of a mass urban box. Urban perception and context, helps avoiding the advancement of the resulting structured volume and expression, adaptive as identifiable through its architecture. The nuanced public space is conceived as a unitary and autonomous place, a separate collection area. As Kieran Long50 points out the interior space is not as fluid as in the case of its Mercedes. But the two cannot be judged by the same measure as this building is marked by a different conceptual demarche than its predecessor.

CASE STUDY 3 – MERCEDES-BENZ MUSEUM, STUTTGART

Mercedes-Benz Museum develops (2001-2006), under the distinctive signature of UnStudio. The trefoil and double helix shape (Hansen, 2006) leads to a continuous walking space surrounding an inner atrium of the building, which hosts the entrance space, the elevators access hall and the opening of all exhibitions across the building elevation. The design of the exhibition has been provided by HG Merz Architekten Museum gestalter – a German architectural office specialised in museum design – who also contributed to Porsche Museum.

Architectural design innovation consists not only in the resulted nuanced volume and shape, but also in the process of project design involving advanced computational actions. The result is suggestively described: "Typical baroque characteristics are omnipresent; the building eludes quick comprehension, refuses to cut clear boundaries, even blurs its boundaries. It is impossible to detect the tremendous forces at work, and even this vehemence is easily concealed by absorbing it into one infinite motion."52 Situated in a wide open public space, Mercedes-Benz Museum is a distinctive object presenting itself as unique and particular in terms of both image and architectural design (Fig. 4). The exterior shape of the envelope follows the interior movement and suggests the fluid continuous walking, reminding somehow the first similar architectural lesson set by the walking path in Guggenheim main hall exhibition in NY – F. L. Wright. Because of the design, the tour of the collection starts at the upper floor, following the ascension by capsule-like elevator (referencing a time capsule). The exhibition space hosts collections grouped on time periods, connecting automobile design with events and historical personalities and specific musical ambiance. The interior architectural space can be described mainly as a show of successive collections, but it also includes complementary activities like a restaurant, a book shop, a debate and lecture area (similar to the other case studies). In the immediate vicinity there is a sizeable multi-storey Mercedes-Benz Showroom and delivery area. The wide outdoor public space is conceived as a negative (bellow ground) extrusion of the street level plaza, with different topographies which include two opened air amphitheatres (both having the museum building as background) for events and concerts. According to Ben van...
Table I. Investigating correlated urban-architectural synthetic factors, the 4 examples: BMW Welt – BMW Museum Munich, Porsche Museum Stuttgart, Mercedes-Benz Museum Stuttgart, Audi Museum Ingolstadt

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Architecture category</td>
<td>museum, cultural</td>
<td>museum, cultural</td>
<td>museum, cultural</td>
<td>museum, cultural</td>
</tr>
<tr>
<td>urban category</td>
<td>insertion, cultural, attraction, touristic</td>
<td>insertion, cultural, attraction, touristic</td>
<td>insertion, cultural, attraction, touristic</td>
<td>insertion, cultural, attraction, touristic</td>
</tr>
<tr>
<td>relation / address to the context</td>
<td>present, but discreet, as an accent of the closed factory (renovated)</td>
<td>response of the client as technologic design ICON-recipe: innovative landmark</td>
<td>response of the client as technologic design ICON-recipe: innovative landmark</td>
<td>present, but discreet, as an accent of the closed factory. ICON through contrast</td>
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<tr>
<td>volume topology</td>
<td>mass emotional architecture</td>
<td>floating volume above public space</td>
<td>man &amp; machine computer design, statement</td>
<td>modernist, rotation volume/volumes</td>
</tr>
<tr>
<td>architecture concept</td>
<td>renovation, re-concept</td>
<td>design concept, all white, autonomous</td>
<td>museum sets up an interface for a series of radical spatial principles in order to create a completely new typology</td>
<td>place for the pursuit of learning history meets modern</td>
</tr>
<tr>
<td>Urban features</td>
<td>almost hidden underground, accent volume near the entrance, correlated with the factory, should be discovered</td>
<td>urban island, nearby the railroad and the bridge above, developing a conceptual public place, but in fact developing paths through the conceptual public space, floating urban object as museum’s expression</td>
<td>plaza with different accesses, upper plaza near the street</td>
<td>in the courtyard of the factory development</td>
</tr>
<tr>
<td>architectural features</td>
<td>the concrete mushroom as accent, the neutral entrance, almost hidden as expression or very discreet</td>
<td>floating autonomous object as museum’s expression, public space intention and continuity, visual connected with the showroom across the street</td>
<td>mono-block sculptural volume, with 2 types of textures-manifestation skins, massive but impressive-emotional comparing with flat + slope plaza</td>
<td>mono-block as central radial space, circular starting from the idea of forum, shaped and round facade-surfaces nuanced, in a rotation understanding of the volume, probably from the concept of mobile-mobility.</td>
</tr>
<tr>
<td>structure</td>
<td>metallic + composite (concrete and metal)</td>
<td>metallic + composite (concrete and metal)</td>
<td>metallic + composite (concrete and metal)</td>
<td>metallic + composite (concrete and metal)</td>
</tr>
<tr>
<td>interior architectural features</td>
<td>bridge road passing through, exhibition concept space – everything with one roof</td>
<td>urban streets and plazas, lighting neutral from the walls, everything is a path, every wall is light and information or exhibition, design should be an expression of art.</td>
<td>interior space segmented but scenographic spaces, articulating 2 states of emotion – the down and the upper, all white as design, all clear and pure – only shape should be visible</td>
<td>*algorithmic architecture, designed from interior state of perception and path through, central atrium, continuous walking space and space exhibition</td>
</tr>
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Berkel, director of UnStudio: "The Mercedes-Benz Museum sets up an interface for a series of radical principles in order to create a completely new typology."³³

Mercedes-Benz Museum presents 125 years of automobile history, 160 vehicles and another 1500 exhibits set out in over 16,500 square meters (from the 35,000 square meters of the total development) and on 9 levels (47.5 m height).⁵⁴ The official website announced 4.4 millions visitors and 100,000 of Facebook fans.⁵⁵

**Case Study 4 – Audi Mobile Forum, Audi Museum, Ingolstadt**

Audi Museum Mobile⁵⁶ is the dedicated museum, established as a part of large Audi platform in the brand’s hometown of Ingolstadt (a town close to Munich). It was completed between 1998-2000 by Henn – an architectural practice based in Munich⁷, and was designed as part of the Audi Forum,
Table II. Investigating correlated figures + numbers synthetic factors, the 4 examples: BMW Welt — BMW Museum Munich, Porsche Museum Stuttgart, Mercedes Benz Stuttgart, Audi Museum Ingolstadt

<table>
<thead>
<tr>
<th>Study Case / Figures + Numbers</th>
<th>BMW Welt — BMW Museum*</th>
<th>Porsche Museum Stuttgart, Baden-Württemberg**</th>
<th>Mercedes Benz Museum Stuttgart, Baden-Württemberg***</th>
<th>Audi Museum Ingolstadt, Bavaria†</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2003 start construction</td>
<td>1971 construction start</td>
<td>2005 construction start</td>
<td>2003 construction start</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>Approx Euro 100 million</td>
<td>–</td>
<td>Approx Euro 100 million</td>
<td>Over Euro 150 million</td>
</tr>
</tbody>
</table>
|                              | –                       | –                                             | –                                                | –
| **Architect**                 | COOP HIMMELB(L)AU        | Prof. Karl Schwanzer                         | Delugan Meissl Associated Architects              | HENN                             |
|                              | –                       | –                                             | HG Merz (exhibition design)                       | –
| **Visitors**                  | 2,5 million/2012         | Over 500,000/year                            | 500,000 (2009)                                   | Over 700,000/2013                |
|                              | –                       | –                                             | 1,000,000 (by June 2011)                         | 122,570/2011                     |
| **Site Area**                 | 25,000 m²               | –                                             | 8,200 m²                                         | –
| **Ground Floor Area**         | 16,000 m² (roof)        | Area of Museum Bowl: 1,000 m²                | 13,333 m²                                        | –
|                              | –                       | Area of low building: 4,000 m²               | 4,800 m²                                         | –
| **Overall Area**              | 75,000 m²               | 12,200 m²                                    | 27,692 m²                                        | 16,500 m²                        |
|                              | –                       | 5,600 m² area exhibition                      | 5,600 m² area exhibition                        | 35,000 m² exhibition space       |
| **Volume**                    | 531,500 m³              | –                                             | 225,464 m³                                       | 210,000 m³                       |
|                              | –                       | –                                             | –                                                | –
| **Exhibits (cars)**           | 284                     | approx. 130                                  | –                                                | 160                             |

f http://press.porsche.com/more/about/porsche_museum/[22.1.2009.]
g http://media.daimler.com/dcmedia/0-921-614318-1-1664139-1-0-1-0-0-0-0-614318-0-1-4-ac.clink169980_3842-0-0-0-0.html[13.2.2014.]

**Results**

All four examples chosen for analysis are the result of architectural competitions each accounting for over 150 entries. The winners have appropriated the developer wishes to create an active and polarizing urban space that would re-centre the local and global museum and tourist activities at European level. The responses of the winning teams were in the sense of continuation of the ideas of urban sustainability, but also the preservation of tradition, in so far as it is seen through the prism of technology historicity. Not incidentally, the competition winners — in all four studied examples (5 buildings actually) originate from Germany and Austria, responding effectively to the concepts of continuation of the carmakers history as well as to the reinvention of the presence, activity and interconnectivity in the urban space of the contemporary German town. Automotive architecture — the museum space — focuses in all the examples on the expertise and history of the brand, its presence in the life of both private community and the state. Also here transcends the ideas of continuity and the joint functioning with the factory (werk) space, of...
the regeneration seen in a contemporary, open sense including the idea of public space inside the building, even adapting elements of urban mobility in architectural language (street, lane, footbridge, difference in level and perception, plaza, discussion place, forum, and so on). The case studies show that historical perspective is enhanced when seen correlated: respecting the tradition of the regional space and technological evolution, while looking into the future for a communication in continuous formation and debate. Definitely all examples are intentionally situated in the area of cultural spaces seen as part of the local events and city life (Table 1).

Some may consider these insertions aggressive or "strangely gratuitous" following the intent to be undoubtedly noticeable, iconic and unmistakable. However the presented architectural and aesthetic discourse, the sculptural volumes, the quality of the resulted urban space, make these objects desirable and accepted as integral parts of the built landscape. We believe that such interventions contribute positively to long term sustainable competitiveness of the newly formed urban spaces and their long-term reconciliation with the cultural space of the city. Mobility stands at the core of both museal and architectural concept, influencing design and making architecture a sustainable product. The statistics show that these are community accepted and highly popular buildings, at the top of public to be visited lists, a preferred holiday or pastime destination.

CONCLUSION

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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 museal insertions with a branded technological mark, acting as key urban developers, promoting innovative architectures and significant investments at city or regional level. It is important to underline that beyond their significant architectural and urban impact – automotive museums enhance and support competitiveness on several levels. Rose and Johnston are right in observing that museums become part of the innovation system. In the view of the article we believe that the automotive museums are at the forefront of this tendency and not only by "leafing through the past". The studied automotive museums 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. As the motor museums evolved they reached a new level of complexity going beyond the role of just displaying historical artefacts but also redefining the link between architecture and automobiles and between the brand, museum and the life of the city on so many levels. Several reflections stem from the presented material.

On one hand – as we have hopefully showed in our presentation – car museums are clear displays of the technology and the intense technological competition present in the car manufacturing world. The museum profile successfully ads a time dimension with reflections towards both past, present and future, by explicitly showing the resilience and adaptation of the automotive industry. Secondly – the studied examples suggest that the inter-brand competition expanded through the presence of automotive museums to other areas of social existence. Now the 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. And obviously this new dimension to the intercity and interregional competition contributes to the city attractiveness, quality of life and of course cultural prestige and touristic dimension. Thirdly – especially in the first three cases looking at the number of visitors and attracted tourists – we can safely state that as museums, these are financially viable and self-sustainable institutions with visible economic effects radiating towards the local community. Reviewing the case studies it is interesting to note how a mass industry led to a niche cultural product and how otherwise common objects (cars) displayed in a cultural urban and architectural layout become an emotional experience. It seems quite clear that some of the economic performance of the brands has transferred towards usually a soft competitive domain – the area of culture and museums – giving to the last a surprising financial viability. In the end – we would like to underline the fact that besides the hard facts and data – visiting automotive museums is a complete emotional and cultural experience which is recommend to all interested readers.

[Translated by CRISTIAN BANICA]

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Fig. 1.5 - Authors

TABLE I., II. M. MIHAILA, 2014