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**СУЧАСНЕ ПРОМИСЛОВЕ ТА ЦИВІЛЬНЕ БУДІВНИЦТВО**
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# АНАЛІЗ ДОСВІДУ РЕНОВАЦІЇ ПРОМИСЛОВОЇ АРХІТЕКТУРИ ПІД НОВІ СОЦІАЛЬНІ ФУНКЦІЇ

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**Анотація**. Дана наукова робота розглядає проблеми реновації промислової архітектури під нові соціальні функції. В роботі відмічено, що промислова інфраструктура (як промислові будівлі, так і промислові ареали) в сучасних умовах великих та найбільших постіндустріальних міст потребує сьогодні нового експериментального рівня використання, який передбачає рівень реновації промислової архітектури під нові соціальні функції: культурні, навчальні, житлові, рекреаційні та ін. В роботі також відзначено, що проводити дослідження в цьому напрямку сьогодні є дуже актуально. Метою наукової роботи є аналіз світового досвіду реновації промислової архітектури під нові соціальні функції (на прикладах Франції, Німеччини, Польщі, України, Іспанії, Португалії, США та ін.), враховуючи досвід Чеської Республіки. Дана наукова робота передбачає аналіз сучасних реновованих промислових об'єктів в контексті впровадження нових соціальних функцій. Згідно з методологією роботи було проведено аналіз об'єктів, обраних методом рандомізації на основі розробленої системи критеріїв на трьох рівнях. За результатами проведеного аналізу були сформульовані узагальнюючі висновки.

**Ключові слова:** постіндустріальне місто, реновація, промислова архітектура, промисловий ареал, соціальні функції.

# АНАЛИЗ ОПЫТА РЕНОВАЦИИ ПРОМЫШЛЕННОЙ АРХИТЕКТУРЫ ПОД НОВЫЕ СОЦИАЛЬНЫЕ ФУНКЦИИ

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**Аннотация.** Данная научная работа рассматривает проблемы реновации промышленной архитектуры под новые социальные функции. В работе отмечено, что промышленная инфраструктура (как промышленные здания, так и промышленные ареалы) в условиях современных крупных и крупнейших постиндустриальных городов требуют сегодня новый экспериментальный уровень использования, который подразумевает уровень реновации промышленной архитектуры под новые социальные функции: культурные, образовательные, жилые, рекреационные и др. Более того, в работе отмечено, что исследования в данном направлении сегодня являются достаточно актуальными. Целью работы является анализ всемирного опыта реновации промышленной архитектуры под новые социальные функции (на примерах Франции, Германии, Польши, Украины, Испании, Португалии, США и др.), а также на примерах Чешской Республики. Данная научная работа подразумевает анализ современных реновированных промышленных объектов в контексте внедрения новых социальных функций. Согласно

методологии работы был проведен анализ объектов, выбранных методом рандомизации, в рамках разработанной системы критериев на трех уровнях. На основании результатов проведенного анализа были сформулированы обобщающие выводы.

**Ключевые слова:** постиндустриальный город, реновация, промышленная архитектура, промышленный ареал, социальные функции.

# ANALYSIS OF THE EXPERIENCE IN ADAPTIVE REUSE OF INDUSTRIAL ARCHITECTURE WITH NEW SOCIAL FUNCTIONS

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**Abstract.** The present paper deals with problem of adaptive reuse of industrial architecture. It is shown, according to present conditions of big and largest post-industrial cities' industrial architecture the industrial infrastructure (industrial buildings as well as industrial areas) demands today a new experimental level of use, that means the level of adaptive reuse of industrial architecture with new social functions: cultural, educational, entertaining, residential, recreational etc. It is noted, that today is relevant to make scientific research in this field. The purpose of this research work is to analyse the worldwide experience in adaptive reuse of industrial architecture with new social functions (in France, Germany, Poland, Ukraine, England, Spain, Portugal, USA etc.), including examples in the Czech Republic. The present research work assumes the analysis of modern adaptive reused industrial objects in a context of new social functions. The methodology assumes the analysis of objects chosen by a randomization method concerning a system of developed criteria on three levels. On the basis of analysis results of experience in adaptive reuse of industrial architecture with new social functions general conclusions have been developed.

**Keywords:** post-industrial city, adaptive reuse, industrial architecture, industrial area, social functions.

## Problem statement

According to present conditions of big and largest post-industrial cities' industrial architecture the industrial infrastructure (non-operating and non-effective industrial buildings as well as industrial areas) demands today a new experimental level of use, that means the level of adaptive reuse of industrial architecture with new social functions: cultural, educational, entertaining, residential, recreational etc. It is important to make scientific research in a context of adaptive reuse with new sustainable social functions today.

Moreover, relevancy of the present research is defined by an aggravating environmental situation in post-industrial cities because of «industrial component» that has a negative influence on health improvement, psychic and emotional state of people and demographic indices etc. [1, 2].

The problem of protection and adaptive reuse of industrial buildings as well as industrial heritage is so relevant nowadays. There are many organizations and institutions which are connected with this problem: scientific and research centers in the leading educational and scientific institutions, committees, specialized organizations with competent professionals, social groups etc. For example, International Committee for the Conservation of the Industrial Heritage (United Kingdom) [3], Research Centre for Industrial Heritage (CTU in Prague, the Czech Republic) [4], International Visegrad Fund (the Slovak Republic) [4, 5] etc. Research in the field of relevant problems of industrial architecture and industrial heritage, including the research of the city environment, carried out today by Prof. Ing. arch. T. Senberger, PhDr. B. Fragner, prof. Ing. arch. P. Urlich, CSc. and Mgr. L. Beran (CTU in Prague, the Czech Republic) [4, 5], Ing. arch. H. Zemankova, CSc. (BUT, the Czech Republic) [4], Prof. H. Benai, I. Lobov (DonNACEA, Ukraine) [6], Sir N. Cossons

(«English heritage», United Kingdom), Prof. Dr. M. Mende (BUA, Germany) [5], Prof. M. Bevz (LPNU, Ukraine), Prof. M. Dyomin (KNUCEA, Ukraine) [6] etc.

The **purpose** of present work: to analyse the experience in adaptive reuse of industrial architecture with new social functions.

The **object** of present research work: adaptive reused industrial objects as well as industrial areas with new social functions.

The **research area**: «converted» industrial objects in the big and largest post-industrial cities in worldwide, including the Czech Republic.

The concept of present research work assumes the following **methodology**:

– analytical method (work with special literature and actual scientific and research works);
– modeling (including the grapho-analytical method);
– analysis and systematization of the studied material.

## Basic material

For the research of present state of the problem of adaptive reuse of industrial architecture with new social functions it is reasonable to carry out the analysis of worldwide experience in this field.

The present stage of research assumes the analysis of modern realized projects of adaptive reuse of industrial objects in a context of present research work. Projects of various modern «converted» industrial buildings in the Czech Republic as well as in France, Germany, Poland, Ukraine, England, Spain, Portugal, USA and from other post-industrial cities in worldwide ware chosen.

The methodology of the analysis of modern realized projects of adaptive reuse of industrial architecture with new social functions assumes the analysis of objects chosen by a randomization method concerning the system of developed criteria on different levels:

1. General information and adaptive reuse characteristic.
2. Architectural features after the conversion.
3. Features of new function.

The First level «General information and adaptive reuse characteristic» assumes the following system of developed criteria concerning the general characteristics of objects and functions:

– name of object;
– location;
– year of conversion;
– size;
– previous function;
– present function.

The Second level «Architectural features after the conversion» assumes the following system of developed criteria for estimation of changes in architectural and interior concepts:

– factor of saving of original architectural concept;
– factor of saving of original interior concept.

Finally, the Third level named «Features of new function» assumes the following system of developed criteria concerning the analysis of adaptive reuse of industrial object with new social function:

– number of new functions;
– type of function;
– social factor;
– sustainable factor;
– connection with a city.

The model of analysis of native and foreign experience in adaptive reuse of industrial architecture with new social functions has been developed (fig. 1.)

For the analysis of the experience in adaptive reuse of industrial architecture with new social functions in the Czech Republic following 12 projects [4, 5, 7, 8] have been chosen by randomization method (fig. 2, 3):

1. AP Atelier and Gallery in Prague.
2. Smíchov library in Prague.
3. Důl Michal in Ostrava.
4. C. K. solnice in České Budějovice.
5. La Fabrika in Prague.
6. Palladium Shopping Center in Prague.
7. M_Factory in Prague.
8. YMCA European Training Centre in Litomyšl.
9. Galerie Vaňkovka in Brno.
10. Důl Hlubina in Ostrava.
11. ŠKODA Muzeum in Mladá Boleslav.
12. Museum Kampa in Prague.

For the analysis of the worldwide experience in adaptive reuse of industrial architecture with new social functions following 24 projects [4, 5, 7, 9] have been chosen by randomization method (fig. 4–6):

1. Multifunctional center Löwenbräu in Zurich, Switzerland.
2. Museum of Brewing in Tychy, Poland.

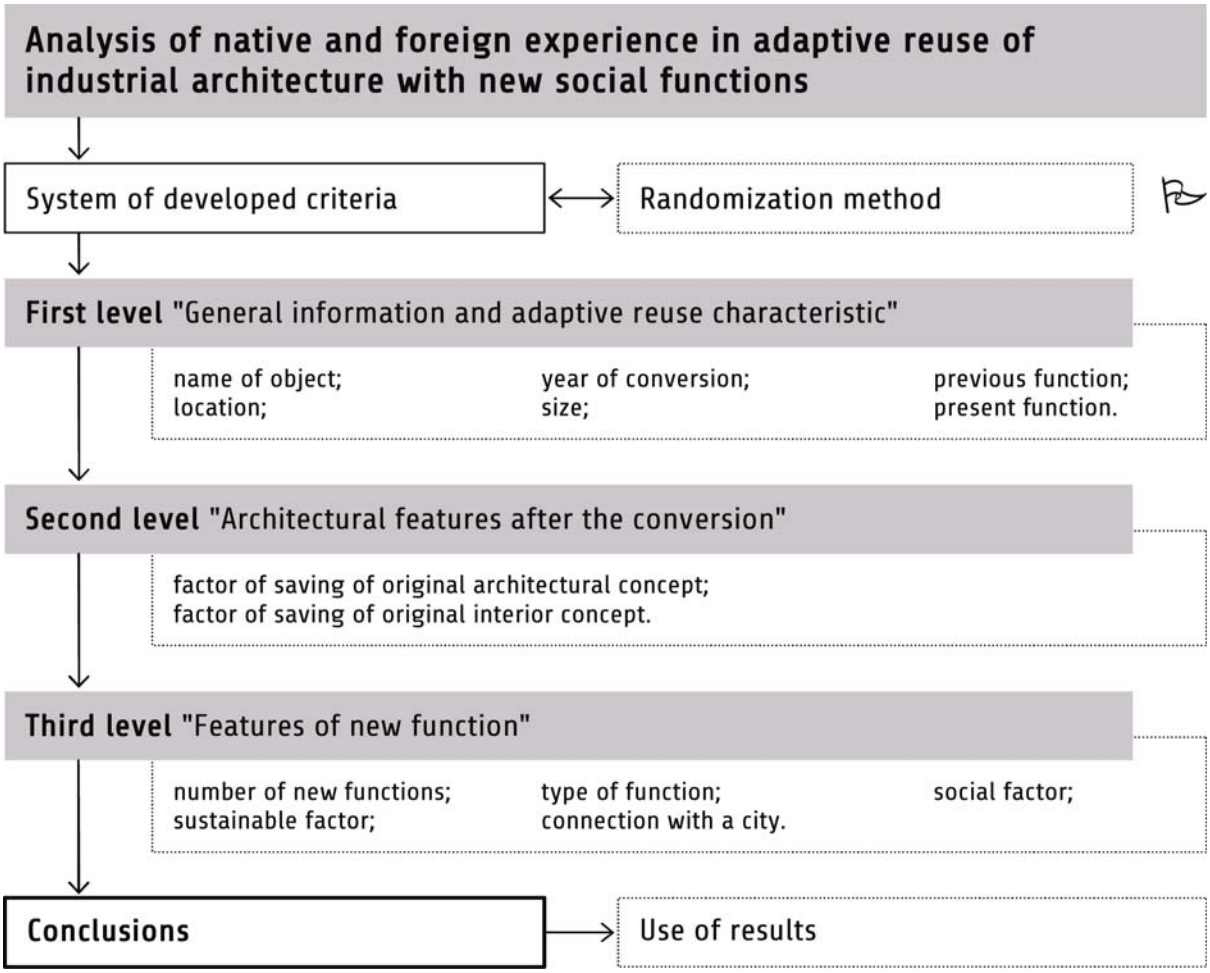



**Figure 1**. Model of the experience analysis in adaptive reuse of industrial architecture with new social functions.

3. International Center of the Future in Arc et Senans, France.
4. Culture Center and Museum in Grand Hornu, Belgium.
5. European Center of Arts and Industrial Culture in Völklinger, Germany.
6. Museum of Science and Technique in Terrassa, Barcelona, Spain.
7. Porto Gallery of Machines in Centro do Norte, Portugal.
8. Gasometer City in Vienna, Austria.
9. Institut La Llauna Badalona, Barcelona, Spain.
10. Regional School of Arts in Angouleme, France.
11. Gallery d'Orsay in Paris, France.
12. Bernardas Convent in Tavira, Portugal.
13. Faculty of Architecture IUAV in Venice, Italy.
14. Modern Arts Gallery in Liverpool, England.
15. Free Time Center in Hamburg, Germany.
16. Modern Arts Gallery in Bordeaux, France.
17. Battersea Power Station in London, England.
18. Water Tower Residence in Soest, Netherlands.
19. Lingotto in Turin, Italie.
20. Alpha Factory in Vienna, Austria.
21. Emscher Park in Emscher Region, Germany.
22. Château d'eau in Steenokkerzeel, Belgium.
23. Decor Donbas in Donetsk, Ukraine.
24. International design center in New York, USA.

On the basis of results of analysis of experience in adaptive reuse of industrial architecture with new social functions in the Czech Republic it is possible to develop following general conclusions:

– the most popular function fore the adaptive reuse of industrial architecture in the Czech Republic is a cultural: museums, multifunctional and shopping centers;
– some examples show that converted industrial object can be arranged with a commercial interest have a commercial component;

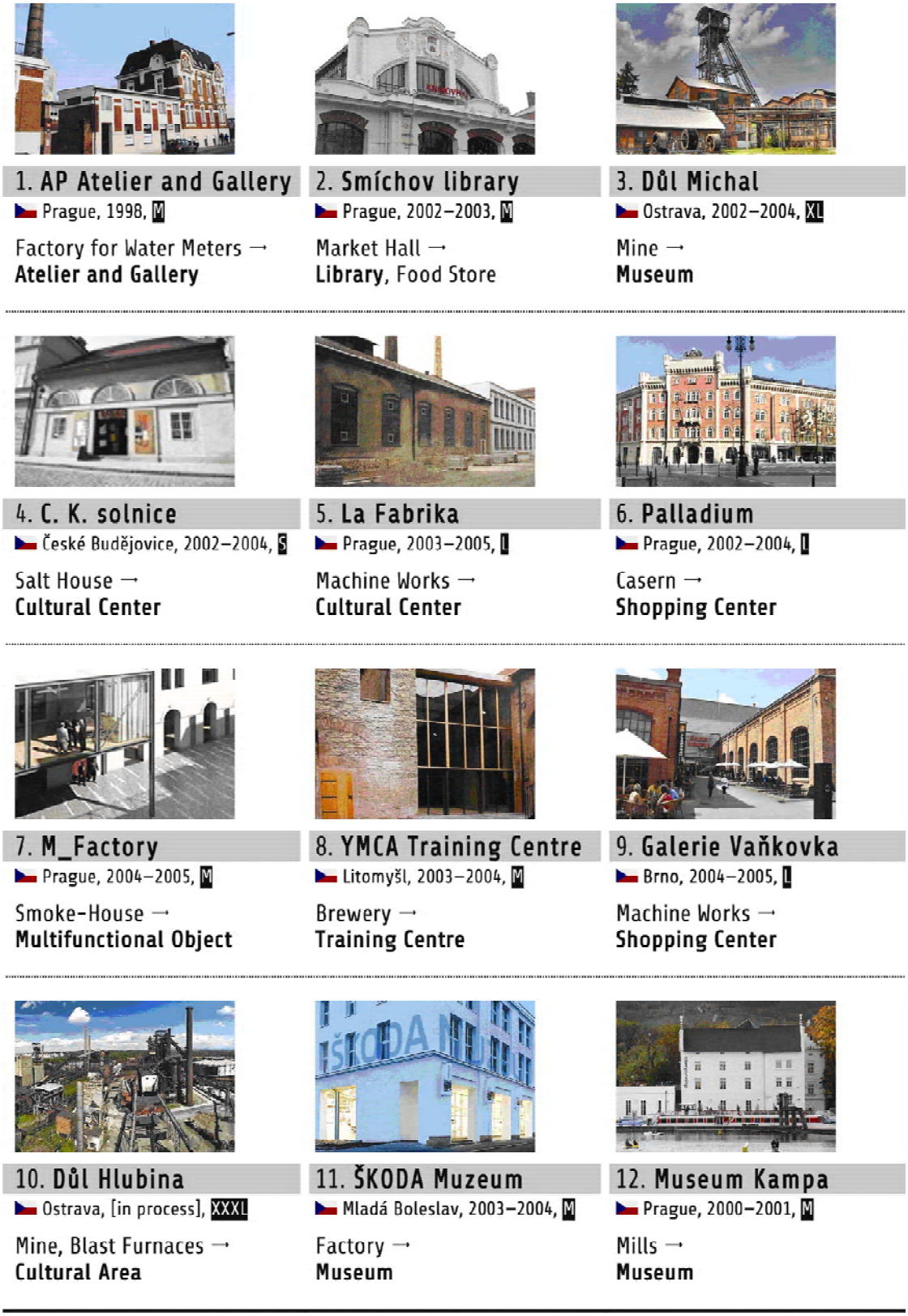



**Figure 2.** Analysis of the experience in adaptive reuse of industrial architecture with new social functions in the Czech Republic at the First level [4, 5, 7, 8].

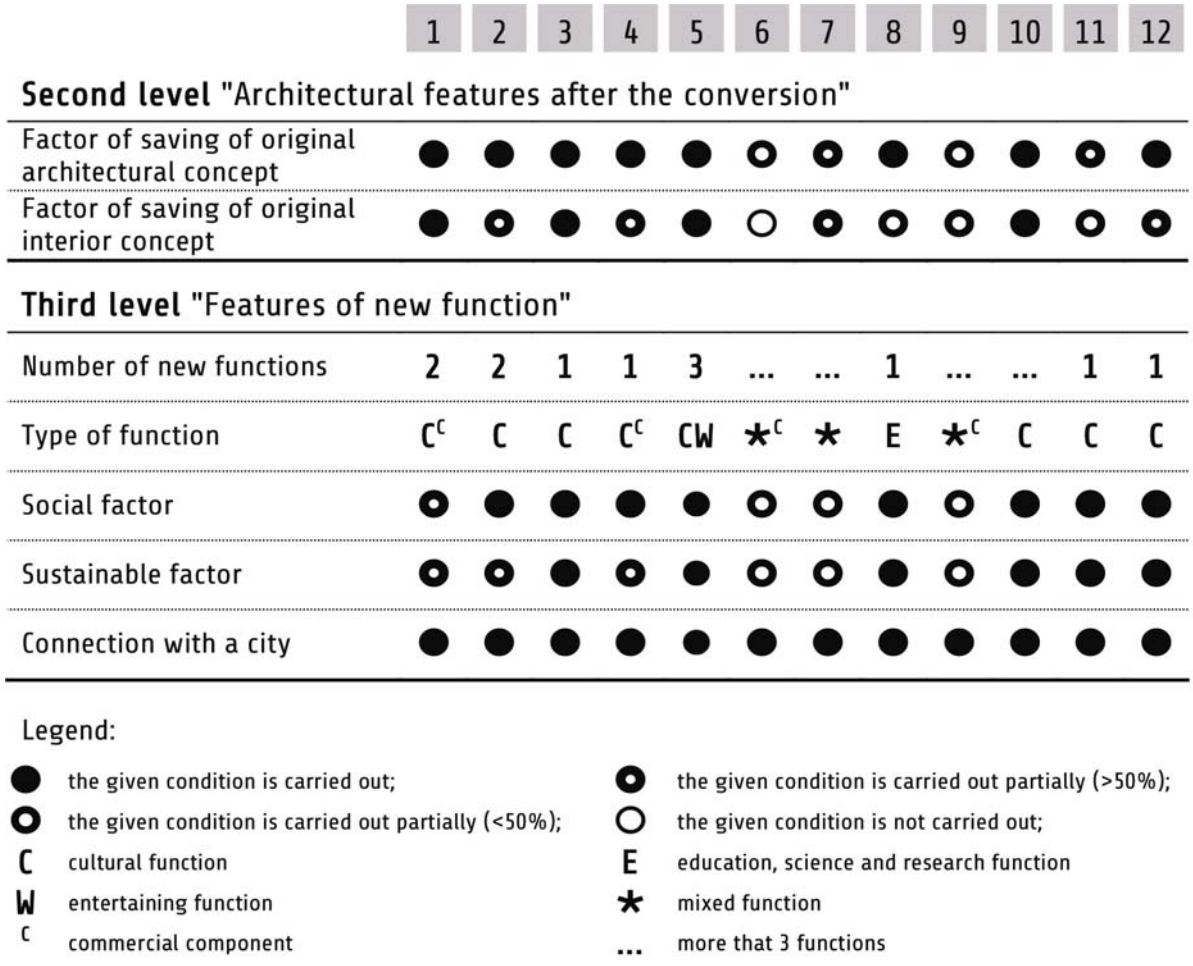



**Figure 3.** Analysis of the experience in adaptive reuse of industrial architecture with new social functions in the Czech Republic at the Second and Third levels [4, 5, 7, 8].

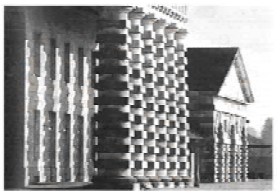
– it is defined, that the Czech Republic has an experience in adaptive reuse of different size industrial buildings as well as industrial areas;
– it is defined, that the biggest large-scale project of adaptive reuse with new sustainable social functions in the Czech Republic is «Důl Hlubina» (The Hlubina Mine, The Lower Vítkovice Area);
– on the basis of the conducted analysis it is reasonable to remark that the tendency of adaptive reuse of industrial architecture started being implemented as a modern and important method in the Czech Republic since the end of the 20th century;
– preservation of the original architectural concept in the frame of adaptive reuse of industrial buildings is typically for the Czech Republic;
– preservation of the original concept of the interior in most instances is not respected;
– multifunctional objects (after«conversion») are dominating;
– definitely, the social factor is taken into account in most cases;
– all examples have a direct «connection» with the city at the all levels.

On the basis of results of analysis of experience in adaptive reuse of industrial architecture with new social functions in worldwide it is possible to develop following general conclusions:

– on the basis of the conducted analysis it is reasonable to remark that the tendency of adaptive reuse of industrial architecture started being implemented as a modern and important method since the sixties years of the 20th century;
– it is defined, that the adaptive reuse of big and largest industrial buildings is more widespread;
– the most popular functions in converted industrial objects in worldwide are museums and multifunctional objects;

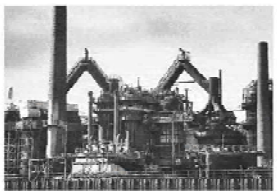
**1. Löwenbräu**
Zurich, 2006–2013, XL
Brewery →
**Multifunctional Center**

**2. Museum of Brewing**
Tychy, 2004, M
Brewery →
**Museum**

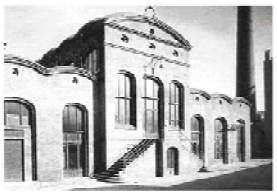


**3. Center of the Future**
Arc et Senans, 1970, L
Salt House →
**Museum**

**4. Culture Center and Museum**
Grand Hornu, 1971–2002, L
Mine →
**Cultural Center, Museum**



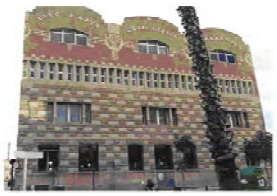
**5. Center of Arts and Industrial Culture**
Völklinger, [in process], XXL
Blast Furnaces →
**Cultural Center**



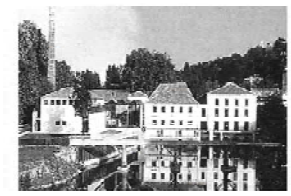
**6. Museum of Science and Technique**
Terrassa, 1990, XL
Textile Mill →
**Museum**

**7. Gallery of Machines**
Centro do Norte, 1999, L
Textile Mill →
**Shopping Center**

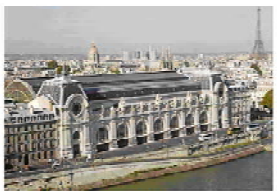
**8. Gasometer City**
Vienna, 1995–2001, XL
Gasometer →
**Multifunctional Object**



**9. La Llauna Badalona**
Badalona, 1987, M
Printing Plant →
**School**



**10. School of Arts**
Angouleme, 1987, L
Paper Plant, Mills →
**School, Museum**



**11. Gallery d'Orsay**
Paris, 1988, L
Railway Station →
**Gallery**

**12. Bernardas**
Tavira, 2006–2012, L
Salt Mine →
**Residential Building**

**Figure 4.** Analysis of the experience in adaptive reuse of industrial architecture with new social functions in worldwide at the First level, projects no. 1–12 [4, 5, 7, 9].

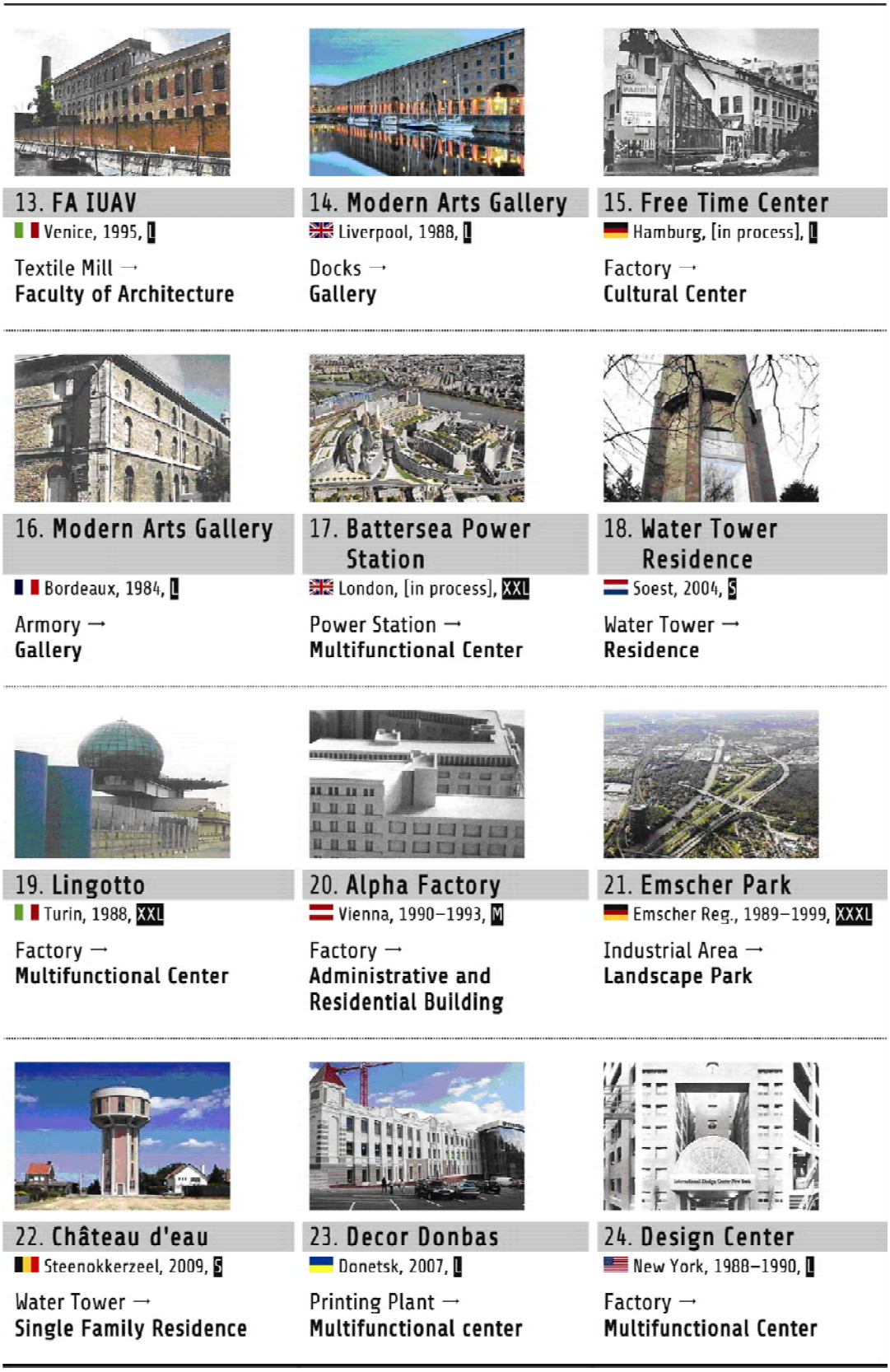



**Figure 5.** Analysis of the experience in adaptive reuse of industrial architecture with new social functions in worldwide at the First level, projects no. 13–24 [4, 5, 7, 9].

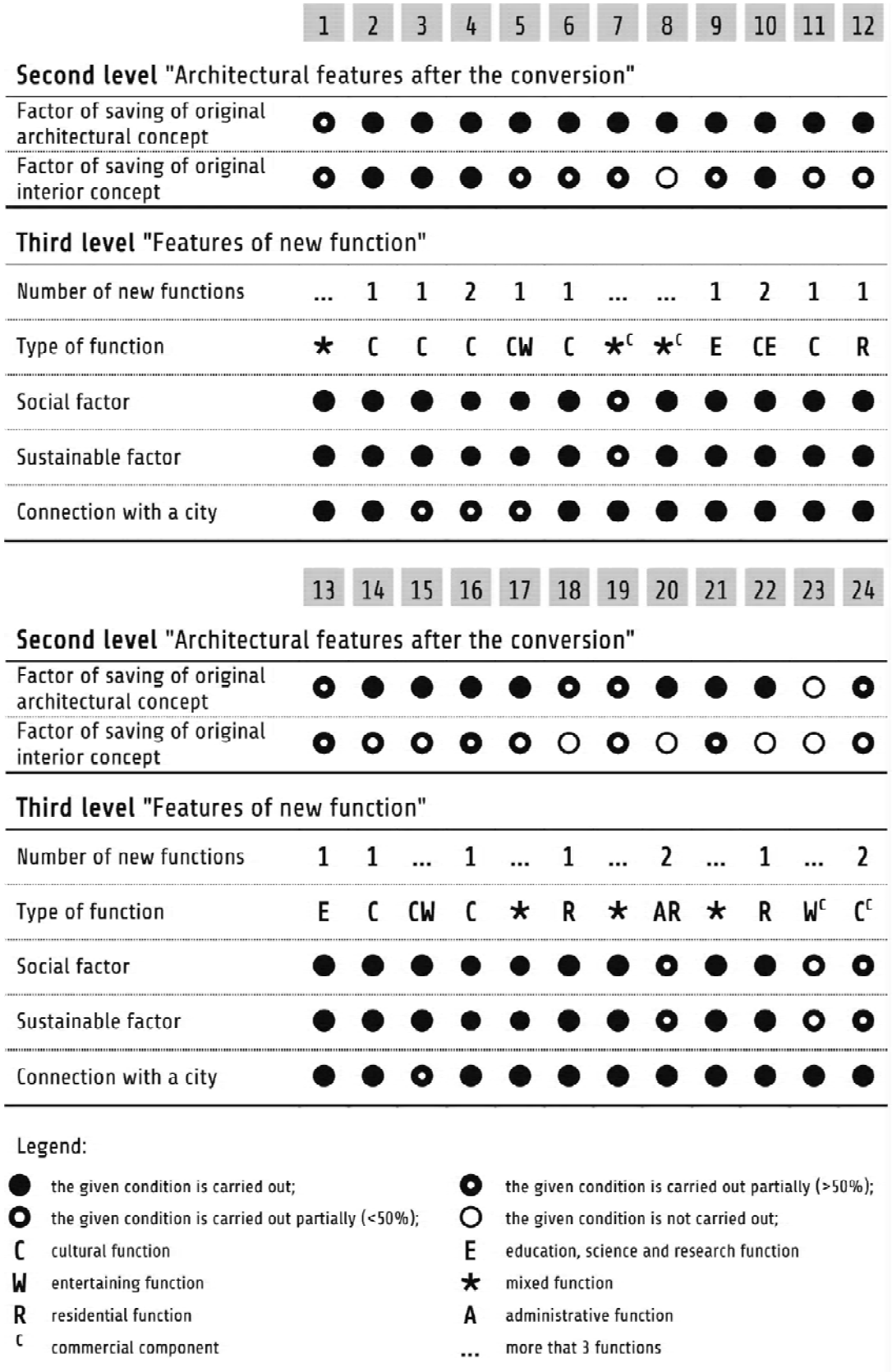



**Figure 6.** Analysis of the experience in adaptive reuse of industrial architecture with new social functions in worldwide at the Second and Third levels [4, 5, 7, 9].

– on the basis of results of worldwide experience analysis in a context of present research work it is important to note, that preservation of the original architectural concept is typically;
– preservation of the original concept of the interior in most instances is not respected;
– definitely, the social factor is taken into account in most analysed examples;
– the objects with 1 or 2 new functions are widespread and more typically for analysed examples in worldwide experience;
– all examples have a direct «connection» with the city at all levels;
– it is reasonable to emphasize, that adaptive reuse of industrial architecture has became the most widespread in England, France and Germany;
– it is defined, that commercial component in analysed worldwide examples is not typically.

## Conclusions

1. The relevance and topicality of the problem of adaptive reuse of post-industrial non-operating and non-effective industrial objects as well as objects in the status «industrial heritage» has been defined.
2. The model of analysis of worldwide experience in adaptive reuse of industrial architecture with new social functions has been developed. This model assumes the analysis of objects chosen by a randomization method concerning the system of developed criteria on three levels: «General information and adaptive reuse characteristic», «Architectural features after the conversion» and «Features of new function».
3. On the basis of results of analysis of worldwide experience in adaptive reuse of industrial architecture with new social functions as well as in the Czech Republic the general conclusions have been developed.

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