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INNOVATIVE PROJECTS FOR THE REVITALIZATION OF OLD INDUSTRIAL AREAS

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Abstract. *The purpose* of this study is to consider the revitalization of old industrial areas in the framework of the project approach, which will take into account modern trends in innovative development. *Methodology*. The authors consider the revitalization of old industrial areas in the framework of the project approach, which will take into account modern trends in innovative development. The study based on the review of successful foreign and domestic experience allowed to summarize the key provisions of the revitalization of old industrial areas. It is determined that modern regional policy is implemented on the basis of targeted solution of specific problems and implementation of infrastructure projects. In foreign countries, new approaches are being applied to stimulate regional development through measures aimed at maximizing the use of regional potential, promoting entrepreneurship and innovation, supporting educational projects and retraining the local workforce, which allows better use of the potential of depressed regions in connection with the development of more prosperous regions of the country. *Practical implications.* The formation of the innovation system of old industrial cities and regions integrated into the knowledge economy concerns the interaction of business entities at all levels: an adequate response of industrial enterprises to changing operating conditions should be supported by effective institutional policy of the region and the state. Studying the world experience of modernization of old industrial regions makes it possible to identify the best practices and tools that will contribute to the development of these territories. Foreign experience convincingly proves the success of such projects and can be very interesting for certain territories and monocities of Ukraine. The choice of a specific model of revitalization should be carried out in each case individually, but the comprehensive renewal of the district territory involves a certain set of measures aimed at determining the new function of industrial areas, their planning structure, taking into account the entire urban organism. *Value/originality.* Based on the generalization of current trends, the promising components of modern projects for the revitalization of old industrial areas were identified. In this regard, the creative cluster is an effective tool for demonstrating modern technologies directly in natural conditions, which contributes to the confident promotion of humane and progressive ideas in modern society.

Key words: old industrial regions, innovations, revitalization, creative cluster, project.

JEL Classification: O25, R11, R58

1. Introduction

In the modern world, economic globalization and the development of new technologies have led to increased competition between countries and regions. Developed countries have already moved to a fundamentally new post-industrial or information model of development. Old industrial regions, which used to be the backbone of the national economy, have turned into depressed areas that need to be transformed by the 1960s and 1970s.

Old industrial regions developed dynamically, but today most of them are in a state of socio-economic

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crisis, in which they found themselves due to the inability to adapt to new conditions. In particular, the problems of old industrial areas are typical for the regions, many of which often do not have modern production facilities and competitive products.

The common problem of the countries that went through a period of transformation in the 90s of the twentieth century is the social, economic, urban planning and architectural consequences of the decline of large industrial enterprises. To ensure the sustainable development of the territories where these enterprises were located, urban planning projects are needed that provide a new and modern look, transforming outdated territories into new urban spaces filled with modern solutions for future residents and all city residents (Sustainable Development of Old Industrial Regions of Ukraine: Innovative Dimension, 2021). In such projects, it is necessary to offer a model and concept that will include a set of solutions necessary for the life, recreation and development of a modern citizen. The territory should receive modern space, additional infrastructure capabilities, engineering networks, social infrastructure, public areas, etc.

The formation of the innovation system of old industrial cities and regions integrated into the knowledge economy lies in the plane of interaction of business entities at all levels: an adequate response of industrial enterprises to changing operating conditions should be supported by effective institutional policy of the region and the state.

Studying the experience of modernization of old industrial regions makes it possible to identify best practices and tools that will contribute to the development of these territories.

2. Literature review

Detrick S. (1999) describes the transformation of a steel-producing Pittsburgh with an extremely tense environmental situation into a center of quality medicine, education, nanotechnology, and financial services. In other studies, for example, Dicken P. (2002) and Koutsk J., Slach O., Boruta T. (2011) analyze the transformation of textile Manchester into the cradle of cultural life through the reconstruction of urban areas, the development of creative industries, and the modernization of transport infrastructure.

The success of Emscher Park, a symbol of the new economy of the cities of the Ruhr region (once the center of the coal and steel industry throughout Europe), is explained by the following factors Shaw R. (2002): commercial companies, non-profit organizations, as well as residents of the region, independently resources. The state was given a predominantly coordinating role.

Despite the availability of significant international experience in the revitalization of old industrial areas, these processes should take into account national specifics and local context. Therefore, the purpose of this study is to consider the revitalization of old industrial areas in the framework of the project approach, which will take into account modern trends in innovative development.

3. World experience in revitalization of old industrial areas

Abandoned factories, ports, warehouses and other unused industrial areas can once again become an important and attractive part of the city. Thanks to the joint efforts of architects, designers, sociologists, local authorities and civic activists, post-industrial zones are being transformed into active areas with residential buildings, business space, public spaces, cultural and tourist attractions. The transformation of former industrial areas has been a popular trend in cities across Europe and the world for over 30 years.

Foreign experience convincingly proves the success of such projects and can be very interesting for certain territories and monocities of Ukraine.

The most famous examples of redevelopment, regeneration and revitalization of industrial areas are located in Western Europe and North America. Some of them need no introduction even for those people who are far from architecture, urban planning and/or tourism. These are London's M&M's World and the Docklands quarter, Germany's Umbau Wassertum and Wunderland Kalkar Amusement Park, Montreal's 780 Brewster, New York's "Lincoln Center" and a number of others. The result of the redevelopment of the industrial canal zone in Birmingham is particularly unique, as the transformation of the city that took place in this case was very significant in terms of its perception by tourists. This is the case when the revitalization of industrial infrastructure resulted in not a secondary, but even a primary city attraction. In the most economically developed countries, there are many examples of industrial redevelopment that are neighbors with natural places of unique scenic and species characteristics, as in the case of the Norwegian district of Rjukan-Notodden. Of great interest is the experience of innovations in industrial zones based on the example of individual industries. For example, the redevelopment of meat industry territories (Slaughterhouses & Meatpacking Districts) as one of the most thematically successful from the point of view of vivid international examples (Strömberg, 2017).

In Poland, revitalization projects began to develop at the beginning of the 21st century. In 2002, work began on the transformation of the Lodz textile factory of Israel Poznański into the Manufactura shopping and entertainment center; in the same year in the

city of Konstancin, near Warsaw, in a factory building of the nineteenth century, a luxurious and chamber shopping center "Old Paper Factory" (Stara Papiernia) appeared. Three years later, the building of the old power plant in the center of Radom housed the Masovian Museum of Modern Art, and in Katowice, the Silesia City Center shopping center, operating on the territory of a closed mine, was put into operation. In 2003, the Old Brewery was opened in Poznań, and the Bolko Loft, a house on the site of a former mine lamp house, was opened in Bytom. After that, the former factories began to turn into residential buildings in Lodz, Gliwice and Zirardow.

In general, the following models of transformation of old industrial territories are distinguished (Kornienko, 2019):

1. The model of preservation of production functions, which is characterized by: preservation of the original appearance of the building (restoration) and technological re-equipment of production in the existing configuration of the building or structure (modernization).

2. The model of partial replacement of functions, which is characterized by: reconstruction of the planning structure with increasing the stability of its characteristics; re-profiling of objects into museums and museum-exhibition complexes; introduction of new objects of urban planning importance in industrial areas of historical and cultural value.

3. The model of complete replacement of functions has the following features: re-profiling of industrial facilities and territories; improvement and landscaping of depressed areas; complete demolition of industrial buildings and use of the territory for other purposes.

4. Key issues of revitalization projects of old industrial areas

The choice of a specific model should be carried out in each case individually, but the comprehensive renovation of the district territory involves a certain set of measures aimed at determining the new function of industrial areas, their planning structure, taking into account the entire urban organism based on the following principles (Chelnokov, Samoylenko, Kozlova, 2016):

1. The principle of sustainable development of the territory.

2. The principle of environmental friendliness. Creation of a favorable environmental climate in the territories under reconstruction or adjacent to industrial facilities by removing or closing harmful production and its elimination.

3. The principle of forming the ecological framework of large areas.

4. The principle of "polycentricity" of the city. Creation of a developed center of the planning district with its own specialization and with the development of both commercial and public functions.

5. The principle of deindustrialization, reduction of industrial activity of the district, replacement of its functional orientation.

6. The principle of priority. Increasing the density and intensity of development in compact areas.

Based on the generalization of current trends, it is possible to identify promising components of modern projects for the revitalization of old industrial areas:

1. "Green offices". The stimulus for the emergence of an increasing number of "green" business centers in Ukraine is the oversaturation of the office segment and the growing competition between facilities. An office built according to "green" standards is characterized by lower maintenance costs and better working conditions for employees. Furthermore, it is an additional opportunity for companies to demonstrate corporate social responsibility and environmental culture. There is a wide range of energy efficient technologies that can be used by developers in the construction and modernization of office space.

2. Redevelopment and reconstruction of industrial areas. Repurposing old industrial real estate in new directions is a global trend that is being implemented in Ukraine.

3. Synergy of formats – the formation of multi-functional centers. Such projects combine workspaces with service, entertainment and educational components. These can be exhibition venues, art spaces, galleries. The trend concerns not only the office segment, but also the real estate market as a whole. An example is "Art-zavod Platforma", the territory of which unites the co-working space of the Platforma brand, large-scale festivals, the creative space "AkT", locations for concerts and holding corporate events.

4. Office center vs full-fledged ecosystem. A standard set of internal infrastructure, including cafes, restaurants, etc. is not enough today. In order for a business center to be competitive, it is necessary to make office projects more service-oriented, taking into account the scope of activities and interests of tenants ("humanization of space" – the opportunity to work, relax, go to the gym, attend lectures, exhibitions or master classes without leaving the business center). Modern business centers are no longer just workplaces, but a full-fledged dynamic ecosystem.

5. Development of coworking spaces. Flexible office formats are becoming increasingly popular in Ukraine. The development of coworking is due to the following reasons: changing approaches to the organization of the work process in large cities, strengthening the role of creative work and outsourcing, as well as the development of new technologies. This format allows companies to optimize office costs.

Creative cluster is a relatively new phenomenon, which is experimental in nature and is implemented mainly through revitalization – the gradual adaptation of illiquid real estate: old plants or factories that were vacated as a result of deindustrialization.

The task of increasing the "creativity" of the economy implies a completely different level of requirements for work and the surrounding space and relations between people. Unlike workers and service personnel, the creative class is not paid for routine work, but for intellectual work and social skills. Such people are less and less ready to work in classic office business centers and require immersion in a special, creative environment.

First, despite the development of remote work opportunities, the synergy of co-location remains important for people in creative professions.

Second, due to such proximity, a high density of events and connections (cultural, economic and social) between people is achieved.

Third, this environment provides an opportunity to gather on one compact platform the audience of consumers of the products of these creative industries (which is often the same for different creative segments).

Fourth, the concentration of creative people, activities and events combined with the design of the space creates a sense of high quality of life that allows to feel comfortable, productive and develop.

The main task of the creative cluster is to attract the creative community of the city and talented youth to its territory, to provide the environment and conditions for the emergence of their business ideas, as well as to produce, promote and sell their products. The absence of any of these elements complicates the task of creating a cluster.

The most attractive for potential residents of the cluster are:

1. Co-location – neighborhood: this factor allows you to be close to your customers, customers and colleagues.

2. Completeness and quality of service: bicycle parking, charging for telephone and electric transport, recycling points, free Internet access.

3. Price / quality: for minimal funds, more opportunities are provided – together with square meters, the resident receives image bonuses of the status of a resident of a fashionable place.

4. Spirit of the place: the presence of the spirit and history of the place, the architectural and aesthetic value of the object.

5. Do what you want: the ability of residents to freely change the rented space for themselves and participate in the design of the overall environment of the cluster.

6. Diversity of layouts: constructive and planning diversity, a minimum of typical and uniform forms.

7. Access 24/7: round the clock access to the territory and the opportunity to spend the night there.

8. A city within a city: human-scale heterogeneous development – ideally an entire block with courtyards, streets, and protected interior space.

9. An engaged owner who can speak the same language with tenants – one for whom the development of a creative cluster is a long-term strategy.

10. Accessibility: the ability to easily reach the space by public and private transport or on foot, the availability of parking spaces.

11. Attractive environment: a well-maintained area that includes places for sports and various activities, street coffee shops, bars, food establishments, as well as attractive design of the territory (artist's works, art objects, high-quality environmental design).

12. Education: open cultural and educational program, spaces for events, exchange of experience and communication.

When creating creative clusters it is necessary to take into account the global trend of energy saving and energy efficiency. In this regard, the creative cluster is an effective tool for demonstrating modern energy-saving technologies directly in natural (operational) conditions, which contributes to the confident promotion of humane and progressive ideas of energy saving in modern society. At the same time, the territory of the technopark can be considered as a kind of "demonstration platform" for the results of science-intensive innovative production activities of the technopark, the search for the most effective technologies of "smart home" and "smart city".

In terms of energy saving, according to the authors, the most promising is the promotion of the following science-intensive fundamental and applied technologies:

– development of solar energy in architecture and construction;

– development of optoelectronics for the production of LEDs and their application in artificial lighting systems for buildings and territories;

– development of technologies for the production of reliable and durable building materials and products with increased heat-shielding, moisture-proofing, air-proofing and sound-proofing properties;

– the use of external building envelopes (walls, windows, roofs, basements, etc.) with an increased level of thermal protection;

– the use of highly efficient engineering systems with automatic control (individual heating points, meters for the consumption of thermal energy and water, thermostats on heating devices, mechanical ventilation with heat recovery of exhaust air); the highest energy performance can be achieved only with the thermal insulation of the entire building envelope and the use of highly efficient engineering systems with automatic control, which reduces the cost of thermal energy for heating and ventilation by 70%;

– improvement of natural lighting systems in buildings through the use of hollow tubular light guides; the use of light guides can reduce the cost of artificial lighting of the building and increase the comfort of people working in the room;
– construction of energy-passive and energy-active buildings; they either consume almost no energy from external sources, or they produce more than they consume;
– the use of a quarterly type of building, which streamlines the planning structure, improves heat and mass transfer processes and contributes to an increase in the comfort of urban development;
– the use of green building technologies, which contributes to the formation of conditions for a healthy lifestyle, primarily by absorbing dust, reducing noise levels and protecting building enclosing structures from atmospheric influences; the use of green roofs smooths out the effect of "heat islands" by equalizing surface temperatures and can significantly reduce the average temperature of an entire city;
– application of multidisciplinary scientific and educational services for the training of competent specialists.

An important factor in the implementation of innovative solutions at the territorial level is international.

Thus, thanks to the EU and UNDP, 20 target communities in Donetsk and Luhansk oblasts received unique marketing strategies, visual identity and brands to strengthen and promote local identity. The project brought together a team of developers with various stakeholders: representatives of local administrations, business, education, civil society activists and cultural figures. Communities and their residents were able to realize the advantages of their own territory for development and turn it into their personal unique brand.

The UN Recovery and Peacebuilding Programme is implemented by four UN agencies: The United Nations Development Programme (UNDP), the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), the United Nations Population Fund (UNFPA) and the Food and Agriculture Organization (FAO).

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5. Conclusions

The formation of the innovation system of old industrial cities and regions integrated into the knowledge economy concerns the interaction of business entities at all levels: an adequate response of industrial enterprises to changing operating conditions should be supported by effective institutional policy of the region and the state. The formation of the innovation system of old industrial cities and regions integrated into the knowledge economy concerns the interaction of business entities at all levels: an adequate response of industrial enterprises to changing operating conditions should be supported by effective institutional policy of the region and the state. The choice of a specific model of revitalization should be carried out in each case individually, but the comprehensive renewal of the district territory involves a certain set of measures aimed at determining the new function of industrial areas, their planning structure, taking into account the entire urban organism. Based on the generalization of current trends, it is possible to identify promising components of modern projects for the revitalization of old industrial areas. When creating creative clusters it is necessary to take into account the global trend of energy saving and energy efficiency. In this regard, the creative cluster is an effective tool for demonstrating modern energy-saving technologies directly in natural (operational) conditions, which contributes to the confident promotion of humane and progressive ideas of energy saving in modern society. Creative cluster is a relatively new phenomenon, which is experimental in nature and is implemented mainly through revitalization – the gradual adaptation of illiquid real estate: old plants or factories that were vacated as a result of deindustrialization.

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