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STALOWA WOLA – THE CITY OF BIG INVESTMENTS. HISTORY, THE PRESENT, THE FUTURE

After regaining independence in 1918, Poland faced the task of rebuilding its infrastructure. One of the main achievements, apart from the port of Gdynia, was Stalowa Wola – a city built on a "raw root" with a closed, avant-garde composition, which was largely realized. The appearance of the city was influenced by the doctrines: modernist (including socialist modernism) and socialist realist.
The article presents a design procedure model that can be used in the case of designing areas with the morphogenesis of a modernist city. The proposed method uses the theoretical considerations of Aldo Rossi and Jan Gehl and the elements of User Experience Design (UX).

Keywords: modernism, Stalowa Wola, new cities, UX

1. Introduction

Planning the development of modernist cities is a difficult task, as they are usually cities with a specific spatial structure that should be protected. The uniqueness of Stalowa Wola stems from the genesis of the uprising. After regaining independence in 1918, Poland faced the task of rebuilding its infrastructure. One of the main achievements, apart from the port of Gdynia, was Stalowa Wola – a city built on a "raw root" with a closed, avant-garde composition, which was largely realized. The investment momentum was visible both in the interwar period, socialist realism and the Polish People's Republic, and it began to weaken during the political transformation of the 1990s [1]. Currently, Stalowa Wola is one of the many poviat towns in the Subcarpathian voivodeship. The characteristic construction of the urban structure, both throughout the city and within the neighbourhoods, was disturbed by individual buildings erected in the spirit of postmodernism. The identity of the city is still visible, but it is necessary to discuss the development strategy for the built space of the city.

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2. Methods

The aim of the work is to analyse the spatial area of the city with a modernist genesis and to indicate examples of directions for the reconstruction of a fragment of the urban tissue in the context of the already existing buildings. The area covered by the study is a part of the city of Stalowa Wola. This area is a communication junction and its structure can be characterized by gaps, problems and spatial conflicts.

The work uses the review method: a framework analysis of the literature, diagnosis of the problem and indication of a potential solution. Visualization in the Lumion program and 3D animation using the Open Street Maps technology were used to geolocate the project using the theoretical considerations of Aldo Rossi and Jan Gehl, as well as the User Experience Design UX method reduced to designing visual experiences. An exemplary spatial concept may become an introduction to further theoretical and practical considerations on the possibilities of creating a built environment in modernist cities.

3. The past

The Central Industrial District was established at the request of the Deputy Prime Minister and Minister of Treasury, Eugeniusz Kwiatkowski. The plan covered the central areas of the Republic of Poland on the rivers of the Vistula and the San. The scale of its assumptions made it one of the largest economic investments in interwar Poland. The decision on the implementation of the COP was dictated by the desire to industrialize the country and the reduction of rural overpopulation. In addition to the economic and financial assumptions, the plan increased the country's defense capabilities and raised its position on the international arena. In its assumptions, it was to economically unite the land after the former partitions and convince the society to state power.

For a more efficient functioning, the COP area has been divided into smaller segments with different activities. It was caused by the desire to use the potential of individual areas in an economic and logistic manner. Within the District, three regions specialized in various industries were identified. In the Lesser Poland Upland, a region called Kielce-Radom (A) was created. It was typically raw material in nature, it provided plastics and semi-finished products for the mental, chemical and mineral industries. In the vicinity of the Lublin Upland, a region called Lublin (B) was distinguished, with fertile soil cultivated by primitive agriculture. Poorly developed industry and economic passivity determined the area of the Lublin region as the granary of the district. As a result, region B assumed the role of food and mixed industry. The last distinguished district is the area of Sandomierz and Rzeszów (C) based on the processing and production industry [2]. The developed Stalowa Wola belonged to the C region, where the focus was on the processing industry, and more specifically the

metallurgical industry. On this initiative, one of the largest COP investments – Stalowa Wola Ironworks with a new city was established there.

There is no single comprehensive plan for the urban layout of Stalowa Wola, but only fragments of individual assumptions. However, the preserved plans are so extensive that you can read the main ideas important in the city's assumptions. From plans from individual years, we can draw up a coherent image of the vision of the designed city, which is inspired by European urban assumptions. Urban planning projects of Stalowa Wola contain elements typical of Ebenezer Howard's garden cities [3].

The industrial areas are located in the south of the designed complex and are entirely surrounded by greenery. According to Howard's assumptions, individual functional areas appear in the form of satellites surrounded by a green belt. In the case of Stalowa Wola, it is also dictated by considerations of air defense, where efforts were made to decentralize housing complexes and important public services. The location of industrial complexes away from housing estates was to protect the lives of residents in the event of an air attack [4].

The city had a typically industrial character – polycentric [5], where it was necessary to separate an area with an industrial function and to build housing estates for workers. The Southern Plants, as this industrial unit was called, were located in the south of the establishment. The communication system of the complex was a checkerboard grid that was disturbed by the oblique railway line.

The entire city was built in wooded areas, where the soil is infertile but provides a good footing for the foundations of buildings. The favourable flat terrain was ideal for creating a city on the so-called raw root, where designers could implement modern European urban concepts, including the garden city. In the designs of housing estates, it was possible to apply the ideas of modernist town planning and architecture of the 1930s, thanks to which the assumptions took on a uniform scale and form of development. The height of the residential buildings ranging from 1 to 3 storeys and the diversified functional and utility layout ensure a consistent and friendly reception of the housing estates. Attention was also paid to the development of public green areas and the development of space around apartment blocks, where greenery was planned already at the stage of parcelling out the buildings.

The eastern part of the city is comprised of representative housing estates based on the meander of the San River. The street architecture has a traditional ridge layout which gives a continuous corridor effect. The perpendicular layout of the buildings to the east-west roads was formed by characteristic lines that were very fashionable at that time. This arrangement ensured proper sunlight and ventilation of urban interiors.

In accordance with the urban planning assumption, the architecture of individual buildings was to be coherent and create a single whole. Particular attention is paid to the aesthetics of housing construction, because it has been implemented in a well-thought-out and coherent concept. The impression of

uniformity was obtained through the use of similar plaster structures, its colour and decorative elements in the form of clinker cladding, which were consistently used in most of the projects.

4. The present

Currently, Stalowa Wola is an industrial poviat town. The city has about 60,000 inhabitants and covers an area of 82.52 km^2. In addition to the area of cultural (industrial) landscapes, an important element of the city are the green and undeveloped areas, primarily the forests of the Sandomierz Forest.

The layout of the city is polycentric, where the poles are formed by: Rozwadów with a historically shaped market square, a city with a residential and service character and an industrial zone covering the areas of the former Southern Works (Stalowa Wola Ironworks) with the adjacent area.

When attempting to isolate characteristic functional and spatial units, about twenty such zones can be distinguished. These areas differ from each other in terms of morphogenesis, function as well as multi-area identity of the place (Fig. 1).

The following zones can be distinguished in the city area:

- scattered rural development in Rozwadów with a large amount of open greenery, arable land and wasteland,
- Market Square in Rozwadów with adjacent buildings,
- areas of single-family residential buildings creating a compact, orderly, often street layout,
- boulevards on the San River, Błonia Nadsańskie allotment gardens,
- the Młodynie and Poręby housing estates in the style of humanized modernism,
- the Śródmieście estate, the core of which is made of modernist multi-family housing in characteristic comb layouts and pseudo-quarters created after World War II as a result of supplementing modernist buildings with socialist realist or socialist prefabricated blocks of flats,
- areas of public services and sports with a modernist genesis,
- former workers' housing estate, the oldest part of Stalowa Wola, in geometrical layouts, originally comb-shaped, later supplemented with prefabricated buildings,
- the Central Estate, i.e. complexes of prefabricated buildings with a doubled line layout. This arrangement can also be called a schematic style. A part of the estate is made of tall buildings in a displaced ridge arrangement,
- the city's service and commercial centre,
- Stalowa Wola ironworks together with the adjacent industrial and business areas.

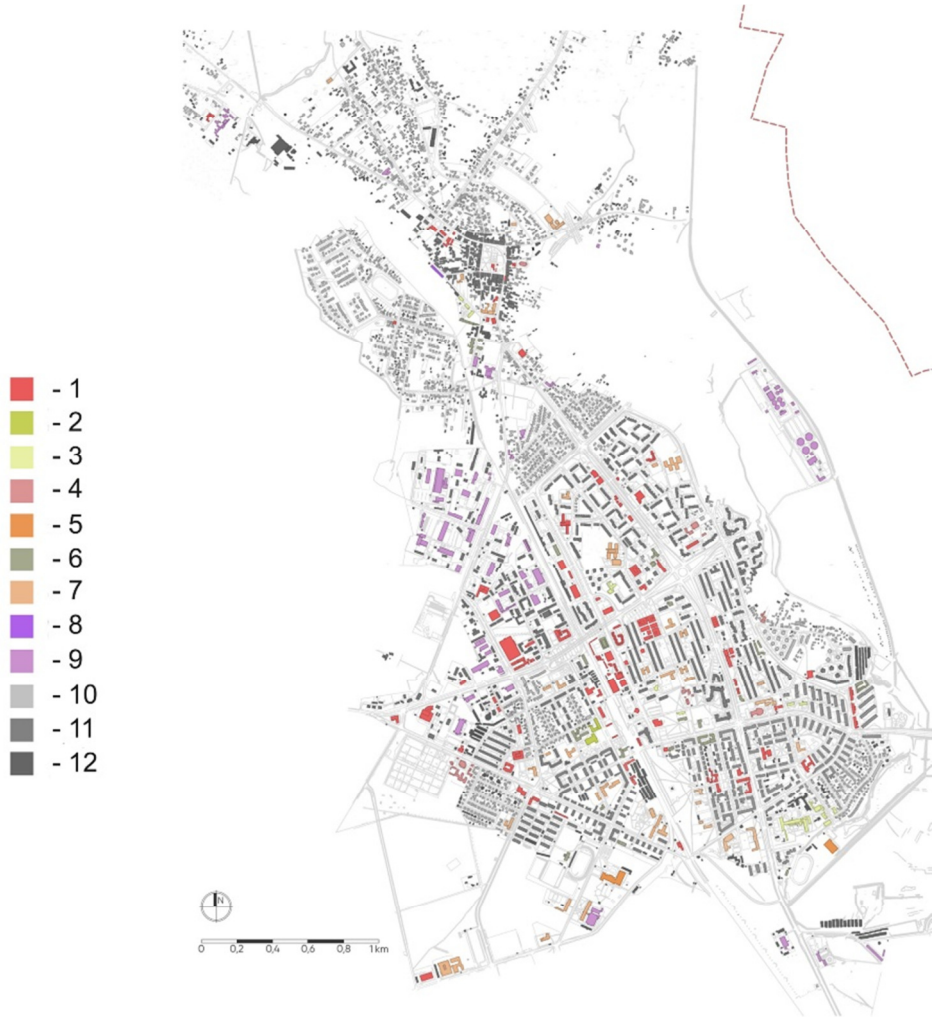

Fig. 1. Functional and spatial structure of the city – general scale, current state, 1 – commercial facilities, 2 – cultural facilities, 3 – medical facilities, 4 – religious worship facilities, 5 – sports facilities, 6 – office buildings, 7 – educational facilities, 8 – communication facilities, 9 – industrial facilities, 10 – single-family residential buildings, 11 – multi-family residential buildings, 12 – warehouses and garages (prepared by A. Sikora, G. Buszta, K. Grabiec, Ł. Czuba, Ł. Dykiel)

When analysing the character of the functional and spatial structure of the city, it is possible to notice the coherence of the buildings built up to the 1990s. Modernist layouts, by definition, are rigid, usually comb-shaped, in the second half of the 20th century supplemented with prefabricated buildings. These additions resulted in the humanization of the layout and introduced the division and hierarchization of public and semi-public space. It is worth emphasizing that the structure of the city is compact and relatively granular.

Against this background, the area located in the central part of the city, located next to the railway line in the area defined as the city's service and commercial centre, stands out unfavourably. The area in question is characterized by great spatial chaos, no crystallization of the urban layout, and illegible separation of interiors and public spaces.

Comparing the strengths and weaknesses of the city, with the indication of areas requiring reconstruction and revitalization, this area seems to be the most predestined for conducting such activities. The current structure of the city lacks a separate, modern multi-functional centre. Improving the quality of the discussed space gives the opportunity to change the character of the city and catalyse its dynamic, pro-quality development.

5. The future

As a result of the analyses of the functional and spatial structure of the city and the simplified qualitative assessment of the urban morphology of a fragment of the urban tissue, the problem and the territory of a potential intervention were diagnosed. After identifying the area of the city requiring revitalization, a forecast (simulation) of the directions of the necessary transformations of the built environment was made.

The applied method is based on the design strategy of Aldo Rossi, where the city is a three-dimensional block built on the basis of memory artifacts and architectural and urban inventory [6] and the study of activity in the area [7].

In the first stage, after analysing the form of objects located throughout the city, with particular emphasis on the immediate vicinity of the degraded area, the leading form of the object was identified. This form results both from the analysis of the city's architecture and the historical identity of the area (Fig. 2, 3).

Fig. 2. Identification of types of forms in the area of study. From the left: horizontal service development, vertical housing development. (prepared by M. Kowal)

The analysis of social activity showed the main channels of pedestrian and road traffic, taking into account individual and collective transport as well as the railway network.

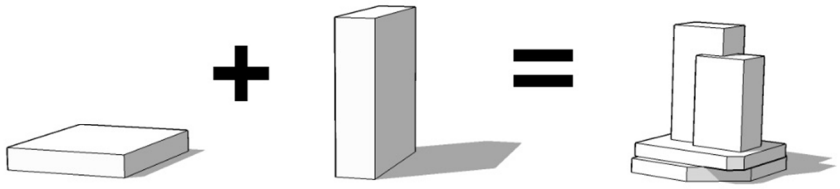

Fig. 3. Creation of a form based on the formal analysis of the context of the place (prepared by M. Kowal)

In the process of negative design (separating public, semi-public and private spaces from a compact cubature mass), a two-dimensional spatial model of buildings was distinguished. After the spatial analysis of the 3D model of the terrain with its closest architectural neighbourhood, the heights of the objects forming the newly designed layout were determined (Fig. 4).

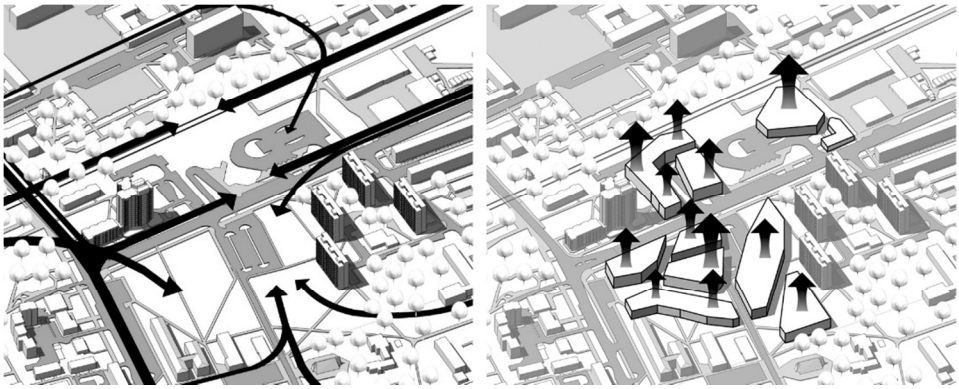

Fig. 4. Analysis of social activity in the area of the study. Preliminary urban layout taking into account spatial connections and social flows (prepared by M. Kowal)

Continuing the analysis of the 3D model of the concept, the building's body was detailed by designing the visual experiences of users (UX in architecture and urban planning) [8]. The analysis was carried out dynamically with the use of computer animation made in the Lumion program, which uses GPS data to present the project in a real context using height maps for OSM Stalowa Wola. At the same time, the formal concept was supplemented with the optimization of junctions and strings of social activity, assuming the primacy of pedestrian traffic over road traffic (Fig. 5).

After determining the principles of shaping a part of the city, the Masterplan of the area crystallized, on the basis of which the concept was detailed, giving the solids and spaces an architectural form (Fig. 6).

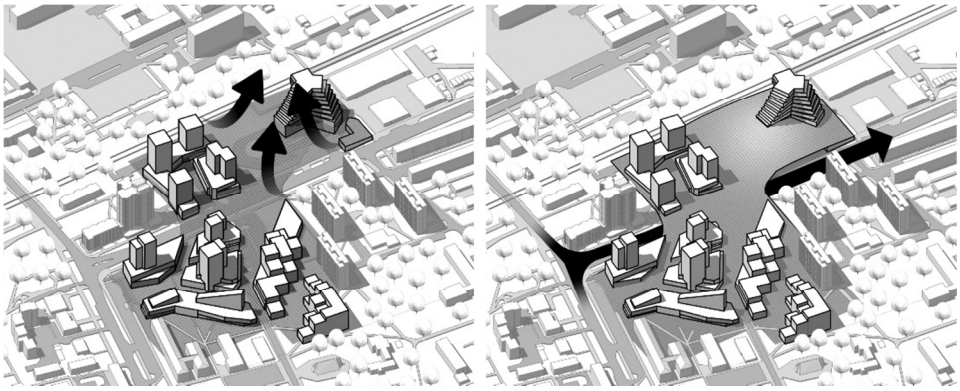

Fig. 5. Specification of the concept based on the UX method analysed on the 3D model of the design concept (prepared by M. Kowal)

Fig. 6. The concept of a multifunctional centre in Stalowa Wola (prepared by M. Kowal)

As a result of the analyses and implementation of the above-mentioned creation methods, a concept for the development of the Stalowa Wola centre was created (Fig. 7).

The idea of the foundation is based on an office building with the function of a station, which is the dominant feature of the layout in terms of cubature, height and a distinctive façade. The dominant feature is a compositional closure for the visual axes in the designed system. Apart from its compositional functions, the building serves as a welcoming place, as it is situated in close proximity to the train station. Along the tracks runs the already existing pedestrian and bicycle trail. It takes the form of a promenade, the slab of which forms a mosaic of square elements with different surfaces.

The platform in the immediate vicinity of the station has the form of a green roof. There is a system of paths with organic shapes on it. The greenery used on the platform is a meadow where you cannot hear the hustle and bustle of cars driving underneath it, but only the rustle of the decorative grass.

Various urban interiors have been created in the centre. Each of the public spaces contains characteristic elements that users identify with a given urban interior.

A completely different space is created in a housing complex. Low greenery predominates, along which the path leading to the entrances meanders. Meanders are accompanied by elevations of the terrain in the form of embankments, which guide the pedestrian's eyesight, providing him with an interesting experience of the changing landscape.

Fig. 7. One of the frames of the animation – view of the study area with its location (prepared by M. Kowal)

6. Summary

Designing the space of the 20th century cities built from scratch is very difficult. These cities are usually built on the basis of modernist doctrine, which did not leave much room for architectural and urban freedom [9]. The primacy of residential buildings is clearly visible in the urban tissue, which is expressed in rigid urban layouts and ineffective architecture. Omnipresent functionalist determines the hierarchy and division of urban spaces into sub-areas. There are no defined public spaces other than the estate greenery in the urban structure.

Stalowa Wola is a flagship example of a city with a modernist genesis. The appearance of the city was influenced by the modernist (including socialist modernism) and socialist realism doctrine. Paradoxically, socialist realist objectd built as a complement to comb-shaped and linear modernist systems influenced the creation of a complex and humanized built environment. Postmodern buildings from the transformation period both supplemented and littered the city space.

The functional and spatial structure of the city lacks an ordered multi-functional urban complex where the city life would be concentrated. The commercial and service district is separate but devoid of the compositional and scenic value. It seems that giving the modernist cities built from scratch aesthetic and compositional values is one of the main tasks that the revitalization designers have to face, and the analysis of design possibilities and identification of appropriate methods of creating space is an indispensable element of the design workshop.

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