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A Vision for Recovery Models of Ukrainian Cities

Abstract

Objectives: The direction of the research is determined by the necessity to generalise and systematise knowledge about the ways of forming and organising the material and spatial environment of human activity at the territorial level, adapted to the needs of modernity. It needs to meet the tasks of sustainable development. The result of the work will be the selection of basic models that will deepen the understanding of the nature of the modern functioning of the living environment as well as will be able to serve as an ideological basis for the reconstruction of war-ravaged settlements of Ukraine.

Research Design & Methods: In order to explore the methods for the recovery of Ukrainian cities, I have studied the European experience of modern architectural and urban planning practice in the cities of Austria (Vienna, Graz, 2022), Germany (Munich, Bielefeld, 2022), and Poland (Kraków, Wrocław, 2022). The main part of the research begins with the selection of attributive categories and the generalisation of various ways of organising the residential environment, which are in the vision of modern European city planning and are expressed through specific concepts and categories. Next, it was about the models that fix the connections and relationships essential to the specified conditions.

Findings: The formation of residential units in Austria, Germany, and Poland made it possible to identify five basic models. Each of them is guided by theories, principles, concepts, and categories relevant to the essence of the model, but they are united by the paradigm of sustainable development. The contents of the proposed models open as follows: *the formal model* is focused on the harmonisation of the urban environment; *the classical model* is about the compliance with industry standards; *the socio-economic model* is involves ensuring equal and sufficient opportunities for citizens; *the ecological model* values the preservation and restoration of the natural environment; and *the conceptual model* is about producing ideas based on innovations.

Implications / Recommendations: Such models do not necessarily have to be tied to specific places, but they are capable of initiating the introduction of new ideas and technologies into the organisation of the material and spatial environment of human life.

Contribution / Value Added: This work is largely related to the filling of a theoretical lacuna that exists in the theory of urban planning, and is provoked by the development of special forms of the social, material, and spatial organisation of the residential environment within a certain territory and under certain conditions.

Keywords: cities, recovery, sustainable growth, theoretical models

Article classification: theoretical article

JEL classification: O180, O440

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Introduction

The end of the war in Ukraine is inevitable, and the post-war reconstruction of the destroyed cities will be very necessary. Today, numerous online platforms are appearing, funds are being created, programmes are being developed, and declarations are being adopted regarding the restoration of infrastructure and the further development of settlements after the consequences of Russia's military aggression. Against the background of recent events, such measures demonstrate the unprecedented unity of the Ukrainian society and the international community, and provide an opportunity to abandon Soviet narratives represented in architecture and urban planning.

The principles regarding the post-war reconstruction of Ukrainian cities, which are defined in official documents as basic (Shmyhal, 2022; *Ukaz prezydenta Ukraïny Pro Stratehiiu staloho rozvytku; Stratehiia staloho rozvytku Ukraïny do 2030 roku* (*proekt*), are rooted in the implementation of European living standards. Some of them have a political and socio-economic nature, but there are also those which are related to various spheres of society, such as architecture, ecology, urban planning, and many others. The proper functioning of each of them contributes to the selection of certain criteria and the establishment of clear methods, which ensures the reliable development of the city. In a complex, both the evaluation characteristics and the rationally-composed methods are able to create a logical model and form a solid foundation for the implementation of the tasks of the post-war reconstruction and development of populated areas. The scale of the destruction and the need to restore the spaces in accordance with the European standards and the practices of life organisation will ensure their significance in both the short- and the long-term.

As of June 2022, more than 350,000 objects of vital infrastructure and 45 million square meters of housing stock have been destroyed in Ukraine. Some of these objects can be restored, while others are completely destroyed (Makuha, 2022; Solovchuk, 2022).

For urban planning, which takes a direct part in the creation of the material and spatial environment of human life, the development of foundations for the formation and organisation of settlements in the conditions of post-war reconstruction is particularly relevant and is measured by a long-term perspective. This necessity is also strengthened by the fact that every year, the requirements for the quality of the Europe-oriented urban spaces are constantly increasing. Therefore, the direction of the research is determined by the necessity to generalise and systematise knowledge about the ways of forming and organising the material and spatial environment of human activity at the territorial level, adapted to the needs of modernity. It also needs to meet the tasks of sustainable development.

Material and methods

This article will be about the selection of basic models that will deepen the understanding of the nature of the modern functioning of the living environment and will be able to serve as an ideological basis for the reconstruction of war-ravaged settlements of Ukraine.

This work is largely related to the filling of a theoretical lacuna that exists in the field of city planning, and is provoked by the development of special forms of social, material, and spatial organisation of the residential environment within a certain territory and under certain conditions. The main part of the research begins with the selection of attributive categories and the generalisation of various ways of organising the residential environment, which are in the vision of modern

European urban planning and are expressed through specific concepts and categories. Next, it will be about the models that fix the connections and relationships essential to the specified conditions.

The problematic situation of the study is due to the lack of works devoted to various aspects of the formation and specifics of the organisation of settlement units at the territorial level and in the context of sustainable development. Therefore, the theoretical basis of the research was made up of the works of international scientists and various levels of institutions regarding the sustainable development of the city (Buchholz & Weigel, 2021; N′oltinh, 2020; Weigel, 2021) as well as the specifics and peculiarities of their organisation at the functional, planning, morphological, and compositional levels (Curdes, 2010, 2015; Frey, 2005; Jabareen, 2006; Litfin, 2012; Pleshkanovs′ka, 2008; Pleshkanovska, 2019; Pleshkanovskaya, 2020; Singh et al., 2019; Timokhin, 2019, 2020). Most of them focus on the characteristics of formal structures in the context of social stability and security within certain settlement units, the quality of the living environment, the rational use of natural resources and sustainability, and, especially, social cohesion. In this context and for understanding the nature of the residential environment, taking into account the modern realities of life, the works related to the formation and specifics of the functioning of closed communities are particularly significant (Durington, 2011; Grant & Mittelsteadt, 2004). The expert circle mostly connects these issues with social topics. At the same time, due to the nature of material expression (Idak, 2020), they function like a territorial object with clear signs and properties, and become the subject of focused attention in the field of urban planning.

The methodological basis of the study invoved the approaches used for the theoretical understanding of problematic situations in the process of deepening knowledge about the formation and development of the material and spatial environment of human life and the generalisation of practical experience. The method of theoretical analysis – which ensured the selection of the research topic, definition of the essence of key concepts and categories for the study, the systematisation and generalisation of facts about the specifics of the functioning and peculiarities of the development of the material and spatial environment of the life of society at the territorial level – also proved its effectiveness. The logical and epistemological approach is included as well. Its application was based on the necessity to justify the reason for the search for scientific foundations, important for solving urban planning problems in accordance with new ideas and standards, and finding conclusions stating that the problem of developing effective mechanisms for implementing the concept also occurs in the field of city planners; as well as functional and planning analysis of the modern residential structure and morphological description.

Practices and models of forming the material-spatial environment of human life

Since the beginning of the 21st century, attention has been paid to the triad of the categories of ‘knowledge’, ‘experience’, and ‘idea’, which have become particularly significant in architecture, town planning, and urban planning, and now it is the basis of the modern system of theoretical and practical thinking. From this position, the need for scientific generalisation and analysis of modern concepts and theoretical and methodological foundations became important. It is also necessary for the formation of the material and spatial environment of human activity in accordance with the conditions of rational thinking and with the necessary assimilation of innovative ideas.

The European experience of the modern architectural and urban planning practice demonstrates sustainability in compliance with the principles of sustainable development at the level of forming and organising public spaces, residential environments, recreational centres, and

other components important to the full functioning of the material and spatial environment of human life. In Ukraine, with the understanding of the necessity to implement a new model of city development (N′oltinh, 2020), trends have become evident. It makes it possible to consider European techniques as basic (Vienna, Graz, 2022). A comparative analysis of examples of such solutions in the cities of Austria (Vienna, Graz, 2022), Germany (Munich, Bielefeld, 2022), and Poland (Kraków, Wrocław, 2022) enabled the identification of the main groups of approaches based on compliance with high social and environmental requirements:

– the formal approach;
– the classical (normative) approach;
– the social and demographic approach;
– the ecological approach;
– the conceptual approach.

In theory, all conditions necessary for the comfortable functioning of the living environment are determined and explained by knowledge from various fields of science and obtained from experience acquired in various spheres of human activity. Thus, *the formal approach* is based on the methods and means defined in the architectural and urban planning composition. *The classical approach* is based on the features of the development and organisation of the functional and planning structure of the urban territory. *The social and demographic approach* is based on specific characteristics associated with the joint activities of various individuals and their interaction on a specific site. *The ecological approach* focuses on the measures aimed at preserving and restoring the natural environment, while *the conceptual approach* arouse from the need to introduce the latest innovative technologies. At this stage of the development of urban planning practice in Ukraine, the conceptual approach is particularly relevant, as there is a huge gap between real scientific and technological achievements and established tools. Its implementation actualises the urgent need to update both the educational and methodological support of the educational process (Kapushchak et al., 2021), as well as the development of recommendation materials for quality work on project solutions.

For the effective implementation of each of the approaches in practice, it is effective to develop certain models in the form of a general scheme of description through the selection of key characteristics for forming and organising the residential environment. In such a situation, they can be a toolkit for solving specific problems based on real experience.

The formal model of the functioning of the material-spatial environment of human life. It is a unique tool of representing urban structures with an emphasis on getting impressions from their appearance. The nature of such a model is determined by the form and rejection of those provisions that determine the necessary filling of the object. Concepts and categories formulated within the framework of composition and morphology are the basis of its understanding. Due to the impossibility of quantitatively reproducing the rules of its organisation, it has a qualitative character. The emphasis on form as an important characteristic of urban structures is present in works that do not lose their relevance and are fundamental for the theoretical understanding of the specifics of the functioning of the material-spatial environment even today. This is the case with the American urban planner and theoretician Kevin Lynch (1960). Although, he emphasised the content embedded in every image of the city, he also paid great attention to the form. In his opinion, the form enhances the meaning of the city, but in no way suppresses it. In his theoretical work (Lynch, 1960), the author focused on identifying the components of the image of the city by comparing it with objective forms: paths, edges, districts, and landmarks.

Researchers in the study of urban morphology talk about form as some characteristic that is devoid of essence and often does not reflect aspects that are important nowadays (Idak, 2020, 2021). Thus, according to Vitor Oliveira (2013), the shape and structure of the city, although dependent on social and economic aspects, reflects them in an indirect way.

The effectiveness of the formal model is ensured by the principles underlying the composition. In urban planning, they act as a way of organising urban structures in order to achieve general spatial unity and harmony, and combine means to ensure the interconnection of constituent parts determined by the artistic design and function of the object.

The traditional problem of modern urban planning is the expression of the compositional centre, which can be equally appreciated both in the panorama and in its direct comparison with a person. Various ways of organising multi-element structures (Figures 1a, 1b) can help solve this problem.

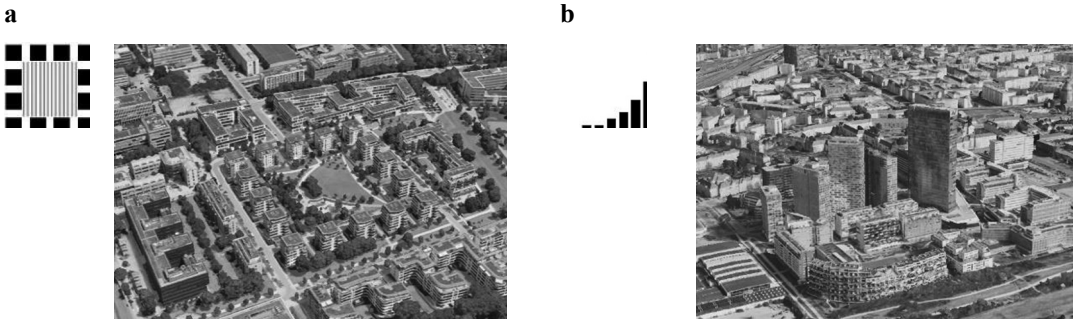

Figure 1. Examples of the formal organisation of multi-element structures: **a** – subordination of form, Munich (Germany); **b** – subordination to the compositional centre, Wienerberg City, Vienna (Austria)
Source: Google Earth 7.3 2022 (see: https://www.google.com/earth/versions/).

The classic model of the functioning of the material-spatial environment of human life. The classic or normative model is a subject system of theoretically-studied and actually approved norms and rules regarding the functional and planning-related organisation of urban structures. A feature of this model is the emphasis on strict compliance with legal acts that regulate the planning and development of the territory. The value of the model lies in the rationality of decisions and the absence of subjectivism.

The principles are basic in the process of implementing such a model. They are the fundamental norms of a methodological nature that regulate the activity of an architect-urban planner. Taking into account the specifics of urban planning in Ukraine, we assume that the principle of zoning and the principle of development should be considered as the main ones. The appropriateness of the allocation of the principle is related to the necessity for the effective distribution of urban structures limited in size and the rational arrangement of the components of the urban infrastructure.

The need to update the functional and planning capabilities of the territory presupposes compliance with the principle of development. As a category, it is one of the main concepts of modernity, as it reflects the transition from one qualitative state to another, and much higher one. The design of large-sized objects requires the determination of rational prognostic aspects regarding the compaction or change of their functional content. Of course, functional changes of such objects will entail changes in other components, such as the planning structure. Because

of this, it is important to predict the direction of development of the designed object. Moreover, if it is possible, one should model it so that in the future such changes do not reduce the level of comfort and safety in the created residential environment. It is also necessary to understand that any changes must be made in accordance with the requirements and needs of the new time.

At the same time, the implementation of such a model as a basic one can cause considerable discussion among Ukrainian scientists and planners. This is due to the need to make certain changes to the legal framework and approaches based on it (Pleshkanovska, 2019).

The classical approach is organically combined and complemented by other methodological approaches, especially those that correlate with urbanism and form the basis of the concept of sustainable development.

The social and economic model of the functioning of the material-spatial environment of human life. The social and economic model is a schematic image of a residential unit, the structure of which is determined by socio-economic and socio-political categories. The mechanism and functioning of such formations depend on the social groups to which it is directed and the economic policy within which they are implemented. There are also cultural differences and a historical background. Because of this, each state, each cultural region has its own socio-economic model. Each model has certain trends and features that can be identified. In one case, they are determined historically and related to the tradition of organising settlements for internally-displaced persons, workers, disabled soldiers, and other social groups. This practice is especially widespread in Germany, and its origins lie in the post-war crisis and the introduction of the newest socio-political model at that time – the social market economy. The new forms of settlement became widespread because of the terrible living conditions in the pre-war buildings (German: *Siedlungen*). Most of them exist today in an unchanged form, with visually noticeable methods of organising the living environment that were relevant at the time: row buildings with compact houses and gardens that surrounded them. There were also blocked houses and perimeter buildings with closed courtyards, and various types of socialisation centres. In other respects, the socio-economic policy is oriented towards the maximum provision of affordable and comfortable housing.

The residential formations '*Domagk*' (Figure 2a) and '*Seestadt*' (Figure 2b) came under special scrutiny. For our research, the choice of these formations was determined by the common idea of providing maximum social benefits at the level of forming the material and spatial environment of human activity in accordance with the concept of sustainable development.

a **b**

Figure 2. Social and economic approach to the organisation of the living environment: **a** – '*Domagk*', Munich (Germany); **b** – '*Seestadt*', Vienna (Austria)

Source: photos by Yuliya Idak, 2022.

The differences in the formal and content-wise nature of '*Domagk*' and '*Seestadt*' can be traced in their organisation. They express certain tendencies. The formal side of these residential formations is described by the morphological characteristics of their material structure[1] and is expressed by the general appearance of the territory, size, and density. If '*Seestadt*' is regularly planned with a high density of built-up territory and relatively large dimensions (1.2 × 1.6 km), then '*Domagk*' is significantly smaller (0.1 × 0.09 km), irregularly planned and with optimal number of buildings in relation to the area of the territory. There are also significant differences in content that are revealed in the urban planning concept. Namely, the economic component dominates in '*Seestadt*', which is manifested in the maximum density of buildings and functions (*Die Seestadt Wiens*: Official site). In '*Domagk*', on the other hand, the social component became dominant (WAGNIS, 2016), which is expressed in the provision of maximum cohesion in a limited territory. Residential buildings were built here in 2012 on the site of one of Europe's largest art colonies. The overriding idea in the organisation of such an institution was the preservation of the artistic component and the creation of opportunities for the implementation of author's ideas at the level of organisation of the subject-spatial environment.

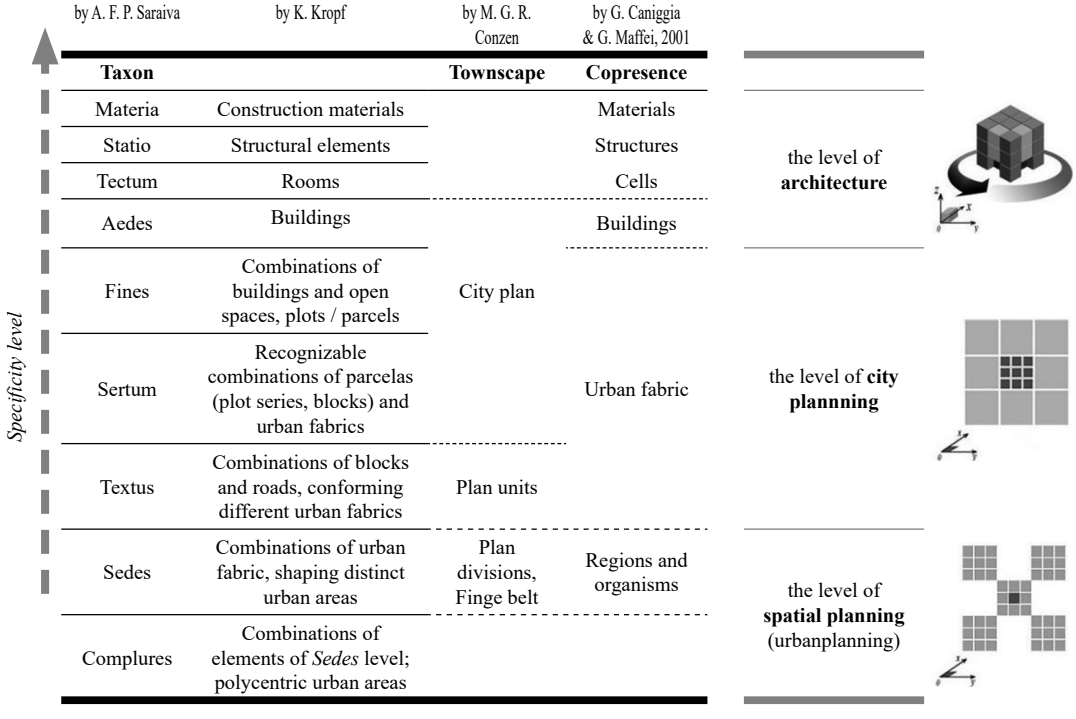

Figure 3. Hierarchy of architectural and urban planning objects and their structural elements (by A. F. P. Saraiva, K. Kropf, M. G. R. Conzen, G. Canigga, & G. Maffei)

Source: Processed by Yuliya Idak, 2020; based on Saraiva (n.d.).

[1] The material structure of the city is the city's substantial level, which is expressed as a set of interconnected structural elements, is opposed to the planning frame, and is considered as its filling at three conventionally-accepted hierarchical levels: macro-, meso-, and micro- (Idak, 2022).

The application of the social approach requires a thoughtful study of the characteristic features of social relations, which express a set of multifaceted relationships that arise between subjects of social interaction and characterise society or community as a whole.

Social interaction does not occur intuitively, but is in a certain way interdependent with other actions and related to different individuals. Here, the model of three levels of interaction in the residential environment finds its place, which is consistent with those that were the basis of research done by European urbanists (Caniggia & Maffei, 2001; Conzen, 1960; Kropf, 2017) (Figure 3):

– *the micro level* – it is a person's private space that functions only with his/her participation; place – living room;
– *the mezo level* – it is the private space of a certain social group towards which an individual feels a sense of belonging and identifies it as his/her own. This is where social control takes place, guided by a certain set of rules and standards. This limits certain actions of the individual, but directs him/her to master clear cultural norms and choose a social role; place – residential building, residential quarter;
– *the macro level* – it is public space owned by the community or freely accessible and used by various social groups; place – district of the city, settlement.

Figure 4. The ecological approach to the organisation of multifunctional complexes of the city, Werksfirtel in Munich (Germany)

Source: photo by Yuliya Idak, 2022.

This approach to understanding a socially-oriented residential environment is especially relevant to Ukraine at a time of active displacement of people who are forced to leave their places of residence. For their successful socialisation, it is necessary to create conditions for free choice and access to various social groups, including the already existing ones.

The ecological model of the functioning of the material-spatial environment of human life. The relevance of the ecological model is dictated by measures aimed at preserving and restoring the natural environment and the policy of sustainable development. Today, to design an eco-settlement is not just to create a populated place, devoid of traffic and built up with houses with high ecological standards. Here, it is important to introduce an effective mechanism for the efficient and economical use of natural resources and the growth of the quality of the environment.

Another effective way of implementing an ecological model is the way to live a greener life away from the contemporary society dominated by individualistic and consumer-based living (Sevier et al., 2008).

The Werksfürtel in Munich (Germany) is a great example when the ecological approach is the basis of the project concept. Werksfürtel is a newly-built area in the northern part of the city on the site of a former factory and is intended for life, work, recreation, and culture, as a way of expressing creativity, forming an individual identity, and strengthening a sense of self in the society (*Werkviertel* – Official site). The priority task in the creation of the district was the ecological approach, which was reflected in the maximum preservation of the existing buildings, the greening of the roofs (the creation of grass and flower meadows and the cultivation of berry crops), the organisation of urban farms (a farm was created on one of the roofs, where sheep, rabbits, and chickens live), the optimal density of buildings and functions, the use of renewable energy sources, and the formation of living fences (which, according to the authors' idea, will have a certain purpose: a habitat for insects, birds, and small wild animals, as well as a way to dispose of the remains of woody plants).

The conceptual model of the functioning of the material-spatial environment of human life. The conceptual approach is a set of ways of creating something, in which the idea is of decisive importance and the created object itself is only a dummy that imitates a certain unit to which attention is directed. Since in the process of designing urban planners often deal with popularising certain innovative solutions, attracting the attention of potential consumers and future investors is of particular importance. Therefore, the conceptual project, as a product within the framework of the implementation of such an approach, functions as something unique, influencing the consciousness and the future of making the necessary decisions at various levels of society.

An example of the implementation of such a development model can be universities, research centres, and high-tech industries, which are more and more often becoming the core of the contemporary city spatial organisation (Pleshkanovskaya, 2020).

As various activities appear, there is a necessity to popularise ideas that are developed without the use of means and methods typical of traditional design. Such an approach is especially relevant at public events, where innovative ideas are demonstrated in various ways, as well as issues related to the urban way of life and its further development are raised. For example, a well-known event of this sort is the Venice Festival of Architecture [It. *Biennale di Venezia*], the main theme of which is demonstrating in an arbitrary form architectural and urban planning solutions for solving problems of a social, humanitarian, and technical nature. This actualises the problem of developing a conceptual approach and effective mechanisms for creating a unique product, moving away from stereotypical thinking about the formation of a material and spatial environment, as well as the introduction of innovative technologies into its structure.

Conclusion

Adherence to the principles of the universally-accepted concept of sustainable development remains a strategic task for the development and restoration of the living environment of populated areas of Ukraine. At the same time, there is a problem in its universality and the extremely wide range of categories it operates with. This complicates the possibility of a successful application of the basic provisions dictated by the concept at the level of urban planning.

International practice demonstrates a clear and coordinated movement in the direction of these provisions' implementation. There are numerous examples of urban-planning solutions that, in a certain way, reflect the norms dictated by the concept. In such a situation, it is considered effective to develop a clear scheme for describing the features of the formation of the material

and spatial environment of human activity in the form of a model with an emphasis on one of the components. At the same time, the unity of the concept will be ensured by the need for clear interaction of other components.

The formation of residential units in Austria, Germany, and Poland made it possible to identify five basic models. Each of them is guided by theories, principles, concepts, and categories relevant to the essence of the particular model, but they are united by the paradigm of sustainable development. The content of the proposed models opens as follows: the formal model is focused on the harmonisation of the urban environment; the *classical* model values compliance with industry standards; the *socio-economic* model puts emphasis on ensuring equal and sufficient opportunities for citizens; the *ecological* models is about the preservation and restoration of the natural environment; and the *conceptual* models focuses on the production of ideas based on innovations.

Such models do not necessarily have to be tied to specific places, but they are capable of initiating the introduction of new ideas and technologies into the organisation of the material and spatial environment of human life.

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