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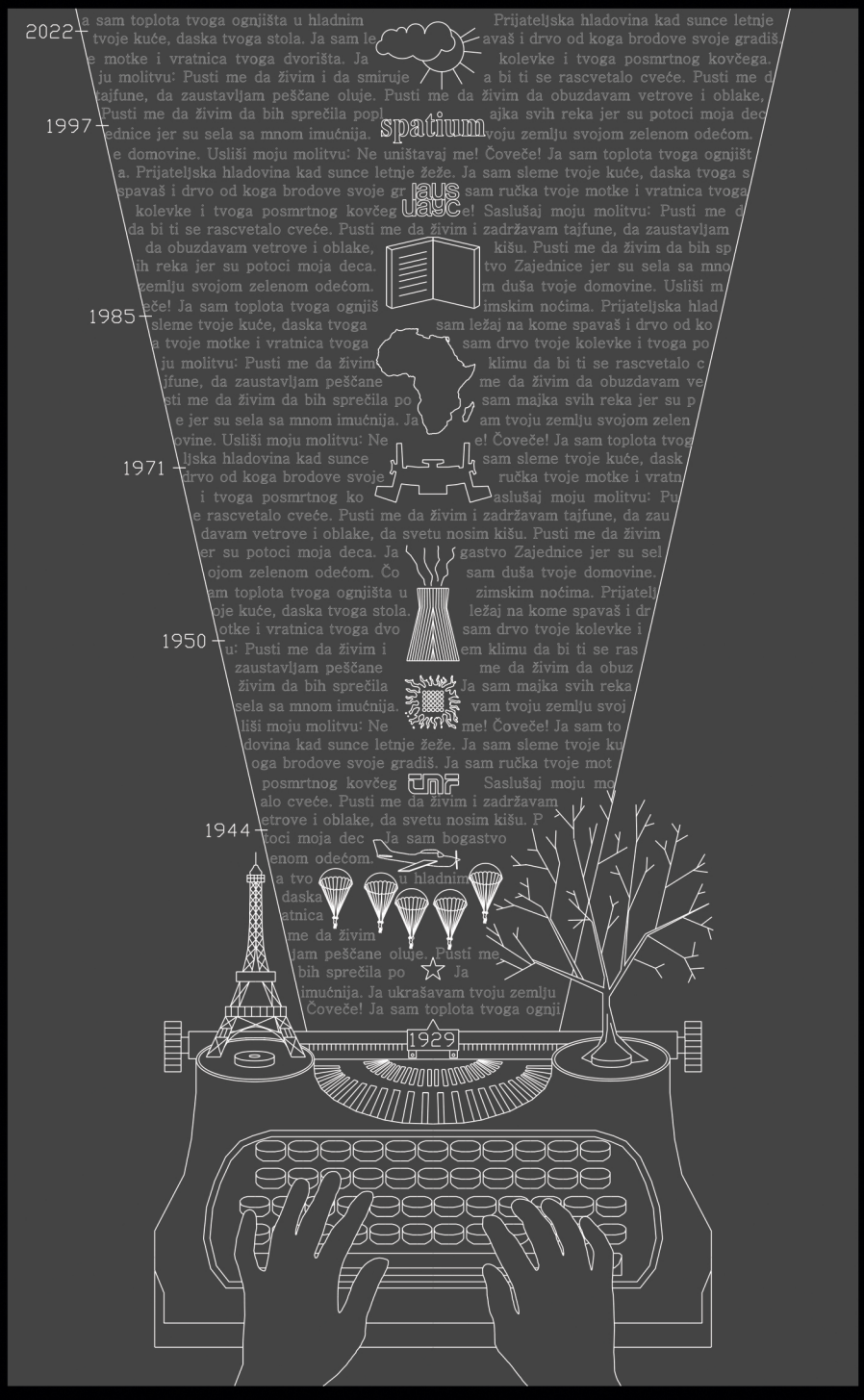

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SCOPE AND AIMS

The review is concerned with a multi-disciplinary approach to spatial, regional and urban planning and architecture, as well as with various aspects of land use, including housing, environment and related themes and topics. It attempts to contribute to better theoretical understanding of a new spatial development processes and to improve the practice in the field.

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EDITORIAL

Dear readers,

The latest issue of *Spatium* (No. 48), which rounds off the publisher's plans for the year 2022, comprises a potpourri of themes and topics elaborated in seven papers, with a special dedication to the first Editor-in-Chief of the *Spatium* journal.

In this issue, we present 5 scientific articles dedicated to certain strategic themes and theoretical analyses, e.g. a global economic development approach through reindustrialization in trans-national comparison, the implementation of circular economy principles in the reconstruction of buildings, and the elaboration of paradigms of socio-architectural knowledge. The scientific articles in this issue of *Spatium* are also concerned with more specific social, urban, housing and architectural design features, in particular within Central and Eastern European cities (Budapest and Lviv). Additionally, this issue includes 2 professional papers: one about urban design elements and aesthetic communication, and the other about the use of Artificial Intelligence tools as stimuli for empathizing with a particular place.

Besides the scientific and professional papers in this issue of *Spatium*, the *In Memoriam* section is dedicated to our dear colleague Nada Milašin, who passed away at the age of 93. She was **the first** Editor-in-Chief of *Spatium*, and Dr Nenad Spasić, former Director of the Institute of Architecture and Urban & Spatial Planning of Serbia, writes about her exceptional life-path, as well as her affiliation with the Institute. The design of the cover page of this issue of *Spatium* is also inspired by the life and "spirit" of our dear Nada.

The journal moves on, always striving to be better, likewise to be fully transparent, and in such an attempt the present Editor-in-Chief has summarized the journal's statistics as indicators for the past year.

In 2022 there were 55 articles in total that were sent to *Spatium* as potential candidates for publishing. Out of them, 34 were rejected (62%). Under the reviewing process in 2022 there were 24 articles (44%). Finally, only 15 (27%) were published in the journal in 2022. For those 15 articles, the average time spent on the evaluation process from the initial submission until the paper's acceptance for publishing was 4.1 months.

Jasna Petrić
Editor-in-Chief

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IS REINDUSTRIALIZATION A REALISTIC PATH? AN EMPIRICAL INSIGHT FROM SOUTH-EASTERN EUROPE

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The global economy has been faced with two dramatic crises (the global financial crisis and the pandemic), and it is still suffering. As an answer to the first crisis, the European Union formulated reindustrialization as a development approach, by which it wanted to strengthen its position on the world market, with the aim of manufacturing achieving a 1/5 share of the GDP. During the last decade, results have differed among the member countries, as well among the candidates for membership. Some countries have continued the trend of deindustrialization, while others have succeeded in starting reindustrialization. However, what is clear is the fact that achieving the goal defined is a challenge for all. There are economists who argue that this goal is not only unrealistic, but even not useful. The paper presents a comparative analysis exploring the development characteristics of several countries in South-Eastern Europe (SEE): Albania, Bosnia and Herzegovina, Croatia, Montenegro, North Macedonia, Kosovo and Serbia, using a meta-analysis in a synthesis of the results of this empirical research. It also shows a regression analysis and correlation analysis using the IBM SPSPS 28 software package. The paper analyzes whether the countries considered follow the trend of deindustrialization or reindustrialization, and it examines and tests whether a higher share of manufacturing within the GDP results in a higher rate of growth. The results show that all the countries under consideration have already fulfilled the aim of manufacturing having a 20% share of their GDP (except Montenegro). At the same time all of the countries, except two (Bosnia and Herzegovina and North Macedonia), have experienced a deindustrialization trend. The paper could be useful for policy makers in South-Eastern European Countries as well other transitory/transitional countries as they create reindustrialization policies in line with the EU industrial policy.

Key words: **transition, reindustrialization, industrial policy, correlation analysis, South-Eastern Europe.**

INTRODUCTION

Deindustrialization is usually understood as a decreasing trend in the share of manufacturing within the GDP, as well as a decreasing trend in the share of manufacturing workers in the total employment. This is recognized as an understandable outcome of development restructuring in predominantly developed countries. It has also been recognized as a trend among countries in transition. Reindustrialization, on the other hand, is considered as a useful and plausible recipe by the European Union for strengthening its position on the Global market, and at the same time as a useful tool for fighting the economic crisis which started in 2008. Savić and Zeković (2004) indicated that (even before the global crises) deindustrialization was already affecting European countries at the end of the 20th century (including the SEE region). Mazzucato (2015) argued that countries with a large share of industry in their GDP appeared more resilient during the crisis and in the after-crisis period. She also believes, contrary to entrenched neoliberal claims, that markets are far from perfect, and that without strong state intervention the economy can be unsuccessful; she emphasized the role of industrial policy for growth, expansion of technology, entrepreneurship and productivity.

The impact of the global economic and financial crisis is reflected in the loss of 20 million jobs in European industry between 2007 and 2016 and the decline of production and competitiveness (Dabrowski and Myachenkova 2018), which also included the Western Balkans. The global pandemic has

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also contributed to the loss of almost 7 million jobs in the EU (CEDEFOP, 2021).

An important development goal for the EU was defined as manufacturing reaching a 20% share of the GDP (EC, 2010).

Among economists, there is no clear answer about reindustrialization policy. Some of them argue that this goal is a unique chance for the EU to fight successfully with competitors on the global market (Kotynkova, 2017), while others have doubt regarding the feasibility of this goal (Ambroziak, 2015), especially after a new crisis started at the beginning of 2020 caused by COVID-19 and its negative economic outcomes. There are economists who argue that this goal is an artificial one, and not appropriate for all member countries, since they are very different regarding their economic condition (Kozarzewski, 2021). Some of them are not so strict, arguing that the problem is related to the statistical treatment of services which are closely linked with manufacturing, especially those with a high involvement of information technologies and digitalization (Ambroziak, 2015).

Like in the EU, deindustrialization of SEE countries took place in conditions of weak GDP growth and a declining GVA of industry (Hadžić and Zeković, 2019), parallel with reforms towards a market economy and mainstream ideological and political changes based on the Washington Consensus (privatization, liberalization, and stabilization). The foreign direct investment (FDI) inflow was insufficient in Balkans countries (Demekas *et al*., 2005), with a lack of intra-regional integration and other resources. Although international actors have been supporting the European integration processes in this region, SEE countries face challenges such as: a low development level, industrial lagging, the impact of global factors on the flows of capital, market and knowledge, the lack of leverages for a new development cycle (Zeković and Vujošević, 2015).

Bearing in mind the transitional context of SEE countries during the last decades, this paper examines the role and dynamics of industrial development, and its effects on total development. More precisely, the paper focuses on the comparative analysis of industrial development, particularly considering the macroeconomic aspects of regional industries in the post-socialist period.

The subject of the analysis is to explore whether there has been a trend of deindustrialization or a trend of reindustrialization among the seven so-called Western Balkan countries: Albania, Bosnia and Herzegovina, Croatia, Montenegro, North Macedonia, Kosovo[2] and Serbia, during the last two decades. It is important to note that these countries (except Albania) used to be part of the unique market of the former Yugoslavia (with the same or a similar industrial policy), so not very different by their economic structure, and at the same time all of them are countries in transition. Only Croatia has become an EU member, while all of the others are still candidates for membership. Secondly, the aim is to estimate, using a regression analysis and correlation analysis framework, the relations between trends in the share of manufacturing within the GDP, the overall development tempo, unemployment, total employment and employment in manufacturing.

After the introduction, section 2 is a literature review, section 3 explains the methodology and data used, and section 4 focuses on a comparative quantitative analysis of the characteristics of industrial development and/by indicators in selected countries of South-Eastern Europe.

THE LITERATURE REVIEW

Deindustrialization is considered as a decreasing trend in the share of manufacturing within the Gross Domestic Product (GDP), together with a decreasing share of manufacturing employment in the total employment (Hadžić and Zeković, 2019). This development path was mainly recognized among developed countries, and was explained as a consequence on the one hand of the restructuring process, in which manufacturing production is moved to less developed economies, due to a less expensive labor force and lower costs of environmental preservation, and on the other hand, due to reorientation toward services and high-tech industries in developed economies (Rowthorn and Ramaswamy, 1997). Unfortunately, a trend of deindustrialization was also recognized in the group of countries in transition, with the negative outcome that these countries do not have not enough marketable products to offer on the global market, thus producing a worsening balance of payments (Milivojević, 2015; Božić, 2009). During the global economic crisis that began in 2008, economies with a higher share of manufacturing in their GDP were more resistant to economic shock and experienced a lower rate of economic recession, if any, like Poland (Moczadlo, 2020). All in all, European authorities defined reindustrialization as the development approach which is recommended for fighting economic recession and strengthening the competitiveness of European countries on the Global market (Europe 2020 Strategy: EC, 2010). The goal was defined as manufacturing achieving a 20% share of the GDP by 2020 (EC, 2010; EC, 2020a; Lojpur, 2016; Zeković and Hadžić, 2020; Zacharchenko, 2019).

One group of economists advocates the goal of manufacturing achieving 20% of the GDP as a rational development approach (Kotynkova, 2017; Zaborova, 2018). These economists are those who emphasize the important role of industrial policy in economic development. They are right in the sense that if the share of manufacturing in the GDP decreases, then the national economy would have fewer and fewer marketable products for export, with an inevitable negative outcome for the national external balance, as it would be negative in the long term. So, the idea is to define and implement industrial policy measures by which the national economy can transform the trend of deindustrialization into reindustrialization (Mengoli and Russo, 2017; Zeković and Vujošević, 2015). It is important to bear in mind that it is not only a matter of increasing the share of manufacturing in the GDP and the total employment, but rather, it should also include introducing environmentally neutral production, energy savings, and a high involvement of knowledge and information technologies (EC, 2011; Nawratek, 2017; Neagua *et al*., 2018; Popescu *et al*., 2015). This platform

[2] We follow a conventional notion: 'Designation is without prejudice to positions on status (under UNSCR 1244/99)', and keep to it throughout this paper.

is based on the existing comparative advantages of the national economy (static approach) with development of new comparative advantages, over time (dynamic aspect) (Bazhal, 2017; Hadžić and Zeković, 2019; Taplin and Ngyen, 2016).

This school of thinking is criticized by those who are biased toward the (neo) liberal approach, who argue that any aggressive involvement of the state in the economy is not welcome and not useful (Ambroziak, 2015). In particular, they criticize industrial policy measures, as these measures are based on subsidies or the preservation of developing industries, known as the infant industry argument. There is also an argument that among the EU countries who adopted the goal of having manufacturing as 20% their GDP, there was no practical majority of member countries, and more importantly, more countries see this goal as questionable (Ambroziak, 2015). It is interesting to note that the most aggressive in this school of thinking are economists from the former communist countries of Central and Eastern Europe, who are near to the position of so-called market fundamentalism (Kozarzewski, 2021).

There are also economists who are not completely against the goal, considering it to be plausible, but they assess it as unrealistic over a short period of time (Kozarzewski, 2021). It is similar to the neo-liberal approach toward the transition process, known as a "one step jump" (Sachs, 1998), and considering the difficulties, and especially opposition by transition losers, this approach during the second half of the 1990s was softened and transformed into a more pragmatic one, the so–called gradualist approach, which recommended a more flexible and step-by-step approach (Fisher and Sahay, 2000; Stiglitz, 2001). Assessing the results of the restructuring among EU countries, it was recognized that a few of them (Poland, Czech Republic) succeed in increasing the share of manufacturing in their GDP, and total employment. This concern was even stronger because of the economic recession caused by COVID 19, which was deeper than the previous one (Moczadlo, 2020).

Some economists argue that the problem is in the wrong computation of what we can consider as manufacturing industry in the modern economy (Ambroziak, 2015). So, the problem from this point of view is of a statistical nature. They advise that manufacturing should not only include production, but also industries and sectors which have a high involvement of information technologies. These sectors are counted or classified as service in a strict sense, but they rather belong to manufacturing, servicing them. By including these kinds of services in the manufacturing sector, it would gain higher value added and higher employment, so in this way its share of the total GDP and total employment would be higher, as well as having an increasing trend (Ambroziak, 2015).

METHODOLOGY AND DATA

Seven countries from South-Eastern Europe, the so-called Western Balkans, were included in the comparative empirical analysis of industrial/economic development. The analysis relies on former empirical research of the industrial development in this region (Zeković and Vujošević, 2015). It is important to bear in mind that until the 1990s, these countries were part of the former Yugoslav single market (except Albania), and were therefore not so different from the point of view of economic policy, or from their level of development and economic structure. One can also take into account that only Croatia from this group has become an EU member (2013), while the others are still candidates for membership (in the long term). This means that all of them, whether they are members or candidates, follow the goals of EU economic policy, including industrial policy (Moczadlo, 2020; Ambroziak, 2015). In the empirical analysis, as a controlling cluster group, we used some indicators of the EU countries. The period under consideration is statistically long enough, 2000-2019. The analyzed period does not include the beginning of transitional changes (1990s), since Serbia (including Kosovo) started with reform changes from 2000 onwards, not earlier like the others. During the 1990s, Serbia faced a serious drop in its GDP, due to non-economic factors. Also, an important fact is that we tried to see the tendencies and development path during the process of transition. Considering the economic crisis started in 2008, we need to bear in mind that all these countries faced recession – more or less deep – and several years long. From this point of view, our analysis was not perfect, as we did not separate the two decades into subperiods.

We applied a meta-analysis as the conventional approach to synthesize the results of the empirical economic research in the Western Balkans. The meta-analysis included the research questions, literature review and compilation, and modelling issues (key variables, datasets, regression analysis and correlation analysis). Our first aim was to examine what happened with the GDP, unemployment and total employment in terms of the growth rate and other tendencies, as well as the share of manufacturing value added to the GDP, and the share of manufacturing employment in the total employment. In order to understand the tendencies better, we compared the results for SEE countries with the EU figures.

We also examined whether there were any statistically significant conditionalities among these variables. A regression analysis was used (in the equation MiGDP = A0+A1GDP+A2UNM+A3EMPT+A4EMM) in order to find out the relationship between the share of manufacturing within the GDP (MiGDP), as a dependent variable, and the independent variables, like the Gross Domestic Product (GDP), Unemployment (UNM), Total employment (EMPT) and Manufacturing employment (EMM). Another aim was to see the form of the regression, and whether the relationship is a positive or negative one. The correlation analysis was used to measure the strength of relationship between the variables mentioned above. The regression and correlation analyses were applied using the IBM SPPS 28 software package. The statistical package IBM SPSS, Statistical Package for the Social Sciences, is among the most used programs for statistical analysis, with a wide range of solutions for scientific and management problems (George and Mallery, 2019; Pallant, 2002).

In order to be correct from a statistical point of view, data were collected from the same source, from the World Bank.

For data missing from this source during the defined period, we used data from national statistical offices.

Several questions were raised: Can Western Balkan countries reach 20% of manufacturing value added (VA) in their GDP, and if so, when? Can a higher share of manufacturing VA in the GDP produce a higher rate of growth? What recommendations could be derived from the investigation for policy makers?

EMPIRICAL ANALYSIS, RESULTS AND DISCUSSION

Industrial development in SEE countries

A comparative analysis of the industrial development indicators in SEE countries measured by the industrialization intensity index and CPI index indicates the dynamics of change and the level of industrial development reached (Table 1). The Industrialization Intensity Index is measured by a simple average of the share of manufacturing value added (MVA) in the GDP and the share of medium and high-tech industries in the MVA (UNIDO, 2020). The first share shows the significance of industry in the total economy, and the second its technological complexity. A comparison of the decline of this index in the SEE region for the given period (1990-2018) indicates deindustrialization (Table 1) and large differences in the industrialization level in the SEE countries.

The Competitive Industrial Performance (CIP) index considers the national productive capacities, intensity of industrialization, and their impact on the market as the main components of industrial performance (UNIDO, 2020), and it shows a measure of the national competitive industrial performance. The regional CIP index indicates deep differences between SEE countries, even up to 5 times (Table 1). The values of both indices in the SEE countries indicate a lag in the level of economic development and a technological gap/divergence of industrial development in comparison to the EU.

The results of the comparative research are discussed according to the specificities of the contextual frame in the SEE region. After the break-up of the former Yugoslavia, the newly established countries started economic redevelopment by means of transition towards neoliberal economics. The key problems of economic development in the SEE region are the consequences of the transitional recession and global changes (e.g., low economic growth, a low competitive economy, high unemployment, the "grey" economy, inadequate institutional conditions for new development, poor technical infrastructure, poverty, refugees, and further lagging behind the EU economies). The main problems in relation to industrial development are strong deindustrialization, low industrial growth, weak competitiveness, slowness of structural changes, further decline in industry's share of the GDP and GVA, a low level of investment despite the inflow of FDI, a significant lag in the application of innovations and new technologies, and inefficient use of material inputs and energy.

The neoliberal concept of development in this region induced the devastation of industrial development. In the period from 1989 until 2012, the reforms led to a strong reduction in industrial employment (1.33 million employees), parallel with a decline in industry's share of the GDP, from 44.5% to 18.43% (Zeković and Vujošević, 2015). The industrial renewal was stimulated through the implementation of the Central European Free Trade Association, CEFTA, regional rules in the energy sector and infrastructure, trade agreements, duty-free exports, and the so-called "mini-Schengen" (the initiative on regional economic cooperation between Serbia, Albania and North Macedonia). In 2020, the industries in the SEE region had a 17.6% share of the total employment, with industry having a 20.7% share in the regional GDP, and 18.9% in the GVA.

The SEE countries have adopted both the South East Europe Strategy 2020 (RCC, 2013) and the South East Europe Strategy 2030 (RCC, 2021) that focus on fostering innovation, skills, trade integration, and smart, sustainable and inclusive growth. The strategies propose changing the actual model of growth by accelerating socio-economic reform, and speeding up measures to modernize the economy.

The Strategy for the Western Balkans (EC, 2018) gives support to the perspective of regional integration into the EU. Also, the European Commission (EC) has adopted an Economic and Investment Plan for the Western Balkans until 2024 (EC, 2020b), with the aim of long-term recovery of the region, green and digital transition, economic cooperation, economic growth, and support for reforms that lead to progress and EU integration. The EC supports the economic convergence of the Western Balkans and the EU,

Table 1. Comparison of Industrialization Intensity Index and CIP index (2019) (Source: UNIDO (2020); World Bank (2021))

	Industrialization intensity index	Competitive industrial performance index (CIP)	Level from 1990 to 2018
Albania	0.11	0.01	Bottom to lower middle
BiH	0.28	0.03	Lower middle to middle
Croatia	0.34	0.04	Upper middle
N. Macedonia	0.34	0.03	Lower middle to bottom middle
Montenegro	0.14	0.01	Lower middle to bottom middle
Serbia	0.38	0.04	Upper middle to middle
Kosovo[2]	-	-	-
SEE Region	0.265	0.028	Middle to lower middle

through investments for competitiveness, inclusive growth, sustainability, and green and digital transition. This implies regional integration into the EU market and its industrial systems that are being transformed according to the European Green Deal ("green" modernization of enterprises, industrial innovations, FDI, export and development according to national Smart Specialization Strategy, S3). The obligation to develop S3 as a new industrial policy was introduced for the EU candidate countries in 2018. S3 has been adopted in Croatia, Serbia and North Macedonia.

The main empirical comparison is based on the regression and correlation analysis of several macroeconomic indicators of industrial development in the period from 2000 to 2019/2020 (see Figures 1 to 4).

The Manufacturing share of GDP

Regarding the first question: can countries of the Western Balkans reach a 20% share of manufacturing in their GDP, the answer is that they are already above this goal, except Montenegro (Figure 1). So, it is not a problem, but there is a problem of another sort – deindustrialization, instead of the recommended reindustrialization. The high share of manufacturing seems not to be related to industrial policy oriented toward reindustrialization, but rather to the common legacy of the socio–economic system of the former Yugoslavia (except Albania). Namely, for several decades industrial development was forced. Serbia had, and still has, the highest share. However, there is a tendency towards deindustrialization among the group, as on average, the share of manufacturing in the GDP has slightly declined, from 22.6 to 22.3%. The tendency of deindustrialization in the SEE region, as a decreasing share of manufacturing in the GDP, was proved using the LINEST function, as it was slightly negative for the whole period for the countries in question (LINEST: -0.1, Figure 2).

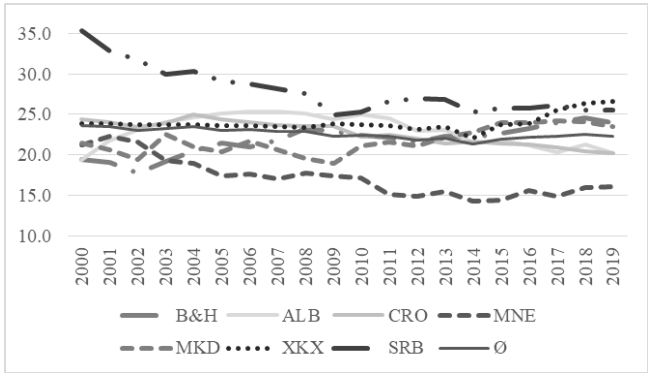

Figure 1. The share of manufacturing in GDP (%)
(Source: World Bank, World Development Indicators)

One can recognize that after the crisis that started in 2008, the recovery of manufacturing was slower than the recovery of services, so the share of manufacturing in the GDP further decreased, but more slowly than the decade before. It is important to note that Serbia was faced with the deepest drop, from 1/3 to 1/5 for the whole period (LINEST: -0.42). Among the countries considered (Figure 1), only Bosnia and Herzegovina and North Macedonia had an increasing share of manufacturing in their GDP, or in other words reindustrialization – during the period (2000-2019) (LINEST: 0.72 and 0.19, respectively).

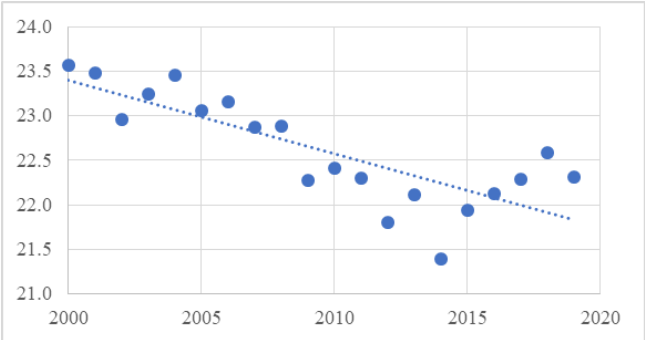

Figure 2. The average share of Manufacturing in GDP (LINEST -0.1)
(Source: World Bank, World Development Indicators)

If we compare these results with EU countries, there is on one hand a difference regarding the share of manufacturing in the GDP, because all of the SEE countries, except Montenegro, still had the manufacturing share of the GDP above 20%, while among EU members just a few of them, like Ireland, Germany, Romania, Poland, Slovakia and Czech Republic had a share of manufacturing higher than 20%. On the other hand, there is a similarity regarding a slight trend of deindustrialization among both the SEE countries, except Bosnia and Herzegovina and North Macedonia, and EU members (Moczadlo, 2020).

GDP Growth Rate

All SEE countries experienced a high rate of growth during the first decade of the 21st century, at 4-5% per year on average, with the less developed countries having a higher rate of growth than others, like Albania, Kosovo, and Bosnia and Herzegovina (Figure 3). All countries in the group faced a recession trend during the crisis, as they had a strong negative influence from EU countries, especially regarding less and more expensive capital and scarce Foreign Direct Investments (FDI) on the one hand, and decreasing demand for export products on the EU market on the other (Boljanović and Hadžić, 2017).

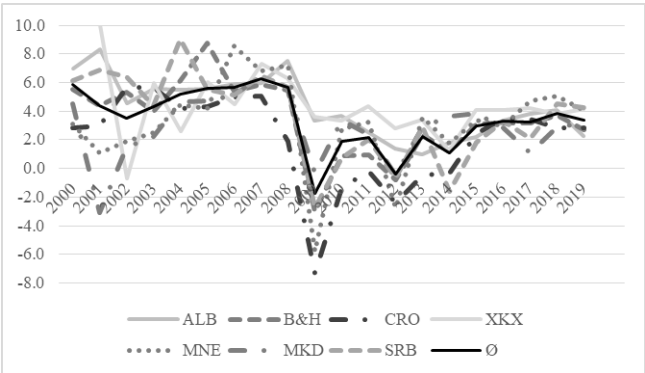

Figure 3. GDP Growth Rate (%)
(Source: World Bank, World Development Indicators)

It is clear that like EU countries, the SEE countries experienced the so–called "W effect", which means a drop in GDP immediately after the crisis started, in 2009, followed by a modest recovery, and again a drop in GDP in 2012, as a negative outcome of the sovereign debt crisis among countries in the PIGS group (Portugal, Italy, Greece, Spain) from the south of the EU (Labus, 2020). During the last

decade, the recovery of the GDP growth rate seems to have been more equal among the countries in the group and modest in comparison to the previous decade, 1-3% per year on average.

If we look at the whole period under consideration, some SEE countries doubled their GDP, or even more. Serbia experienced a cumulative growth of 102% in its GDP in the period 2000-2019, Kosovo 129% and Albania 147%, while Bosnia and Herzegovina had 98% growth, Montenegro 84% and Croatia 48%.

Comparing the rate of growth in the group with the rate of growth in EU countries, one can recognise a higher rate of growth in the SEE countries in both subperiods, or decades. It means that SEE countries over time reduced their lag in the level of development behind the developed EU countries, but the discerpancy is still big. The modest recovery in the Eurozone during the last decade can be explained by the hesitation of the European Central Bank to introduce an aggressive expansive monetary policy, as the Federal Reserves (FED) and the Bank of England (BoE) have done, starting a monetary expansion policy, from 2016 on, with economic recovery slower than expected.

If one looks at the cumulative growth of the gross VA and manufacturing VA during the period under consideration (2000=100), then it is clear that manufacturing value added in the SEE countries experienced a higher growth rate than the Gross Value Added. However, as noted before, this is due to the higher rate of manufacturing growth during the first decade, because during the second decade, the growth rate of manufacturing VA slowed down, as the recovery of services gained momentum and generally speaking, services and GDP increased more than manufacturing. Bosnia and Herzegovina and North Macedonia had a much higher rate of manufacturing growth than GDP growth, while Montenegro and Albania had a similar cumulative growth of both variables. At the same time, Serbia, Kosovo and Croatia faced a lower rate of manufacturing growth than GDP growth.

Unemployment, Employment

Generally speaking, the SEE countries faced a high level of unemployment. Bosnia and Herzegovina, North Macedonia, Montenegro and Kosovo experienced a higher-than-average share of unemployment in the total labor force. This high rate of unemployment during the last two decades has been caused by the restructuring process related to the market reforms introduced. It means that former socially owned companies faced problems of labor surpluses, and at the same time new companies, predominantly small and medium scale, were not strong enough to absorb these surpluses of employees. It also implies that the restructuring process of existing companies needs time to become profitable and capable of growth. During the 2008 crisis, the reaction of companies to new, worse business conditions and to the drop in demand for their products was late, or rather later than it should have been in a market economy.

One can recognize a positive trend of decreasing unemployment in all SEE countries. With economic recovery after the crisis which started in 2008, the unemployment rate went down. For instance, unemployment decreased in Kosovo from 54% to 26%, in Bosnia and Herzegovina from 26% to 16%, in North Macedonia from 32% to 17% and Montenegro from 31% to 15%. In other words, SEE countries need a higher rate of economic growth in an attempt to curb high unemployment.

It is possible to achieve an interesting result by measuring the share of manufacturing employment in the total employment (Figure 4). Of course, it is closely related to the share of manufacturing (value added) in the GDP, and to the characteristics of the main industries within the manufacturing industry. North Macedonia had the highest share of manufacturing employment in the total employment (34-31%), followed by Bosnia and Herzegovina (30-32%) and Croatia (27-28%). At the same time, Serbia experienced a drop in the share (35-27%).

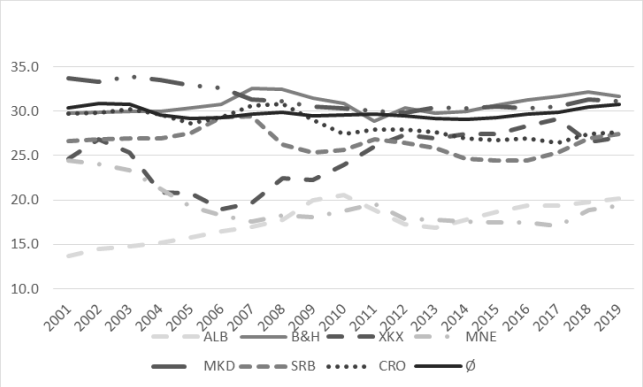

Figure 4. Employment in Manufacturing (% of Total) (Source: World Bank, World Development Indicators)

In the SEE countries during the period of market reforms and restructuring, industrial employment grew faster than total employment (on average total employment in 2019 was 21% higher than in 2000 and industrial employment 34%, respectively). So, it is similar to the relation between manufacturing VA and GDP. Albania experienced the highest cumulative growth and a high discrepancy (87% and 19%, respectively), followed by North Macedonia (82% and 45%), Bosnia and Herzegovina (37% and 29%), Croatia (14% and 9%) and Kosovo (3% and -22%). Montenegro and Serbia experienced slower growth of manufacturing employment than the total employment (38% and 74% and -26% and -7%). Regarding Serbia, one has to bear in mind that the drop in the total and industrial employment is mainly caused by legal reasons. Namely, during the 1990s, officially (by law) no employees could be fired, while at the same time the GDP and production dropped by half. This hard administrative measure was annulled at the beginning of the 2000s, so companies started to adjust by dismantling the number of employees, and the drop was deeper than it would have been in normal circumstances.

The regression and correlation analysis

In order to clarify the previous results, the regression and correlation analyses were performed using the IBM SPPS 28 software package. Firstly, the regression analysis was used to find out the relationship between the share of manufacturing in the GDP (MiGDP), as a dependent variable, and independent variables, as follows: Gross Domestic

Table 2. The regression results for the whole group of SEE countries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763[a]	.581	.470	15.5768

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5055.651	4	1263.913	5.209	.008[b]
	Residual	3639.549	15	242.637		
	Total	8695.200	19			

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	801.329	464.515		1.725	·105
	VAR00002	.436	.108	.688	4.047	.001
	VAR00003	-.193	.120	-.444	-1.605	.129
	VAR00004	.252	.267	.173	.941	.362
	VAR00005	-.282	.312	-.258	-.905	.380

Product (GDP), Unemployment (UNM), Total employment (EMPT) and Manufacturing employment (EMM) in the equation MiGDP = A0+A1GDP+A2UNM+A3EMPT+A4EMM. It was also useful to see the form of the regression and whether the relationship was positive or negative. Secondly, the aim was to measure the strength of influence between these variables using correlation analysis.

Firstly, we used regression analysis in order to find out the relationship between MiGDP and the other variables GDP, UNM, EMP and EMM, the shape of this relationship and whether the influences were positive or negative. So, the proposed equation was MiGDP = A0+A1GDP+A2UNM+A3EMPT+A4EMM, where MiGDP is dependent and the others are independent variables.

For the whole group of countries under consideration we obtained the following equation: MiGDP=801+0.4GDP-0.1UNM+0.2EMT-0.2EMM. The results show a satisfactory value of R^2 (R^2 = 0.581), which shows how much of the total variations in the dependent variable can be explained by independent variables. More precisely, it means that 58% of variations can be explained. Also, the data fit well, as the statistical significance of the regression model is 0.035 (less than 0.05 as a statistical limit).

The results were mixed for each country. For Albania the equation was MiGDP = 960+0.53GDP-0.124UNM+0.175EMPT-0.034EMM. The R^2 value was 0.478 which is modest, while the coefficient for significance fits well as it is 0.035. For B&H the equation was MiGDP = 648+0.428GDP-0.028UNM-0.01EMP-0.026EMM with an R^2 value of 0.47, which is modest, and the coefficient for significance fits well, as it is 0.035. The equation for Croatia was MiGDP = 559+0.492GDP-0.061UNM+0.075EMP-0.051EMM with a high R^2 value of 0.789 and the coefficient for significance fits well, as it is 0.001. For Kosovo the equation was MiGDP = 817+0.229GDP-0.063UNM-0.093EMP+0.018EMM with a low R^2 value of 0.272 and the coefficient for significance is too high, as it is 0.282. The equation for Montenegro was MiGDP = 1414+0.128GDP-0.356UNM+0.060EMP-0.221EMM with a very high R^2 value of 0.823 and the coefficient for significance fits well, as it is 0.001. For North Macedonia the equation was MiGDP = 1079+0.006GDP-0.024UNM-0.192EMP+0.112EMM with an R^2 value of 0.426, which is modest, and the coefficient for significance is too high, as it is 0.066. For Serbia the equation was MiGDP = 1024+0.451GDP-0.089UNM-0.060EMP-0.303EMM with a high R^2 value of 0.626 and the coefficient for significance fits well, as it is 0.004.

Secondly, we used a correlation analysis to measure the strength of relationship between the variables under consideration, and not surprisingly the results were mixed. It means that there were different tendencies in the manufacturing share of the GDP during the period under consideration among the SEE countries, as explained before. Only two countries experienced an increasing trend of reindustrialization, North Macedonia

Table 3. Correlation of the average of SEE countries

Variable	Variable2	Correlation	Count	Lower C.I.	Upper C.I.
MiGDP	GDP	-.469	26	-.725	-.100
	UNM	.490	26	.126	.737
	EMPT	-.821	26	-.917	-.637
	EMM	.972	26	.937	.987

and Bosnia and Herzegovina, but the majority of them experienced a decreasing trend, or in other words, a deindustrialization trend. On average there is a slight tendency of deindustrialization, as well. As stated before, it can be understood as the legacy of the previous socio-economic system rather than the outcome of a defined industrial policy. On average (Table 3) there is a very strong positive correlation between the share of manufacturing in GDP (MiGDP) and manufacturing employment (EMM) (0.972) for the SEE countries, which is understandable, and a strong negative correlation with total unemployment (EMPT) (-0.821). There is a significant negative correlation between manufacturing share and GDP growth (-0.469) and a significant positive correlation with unemployment (UNM0.49).

For the discussion of the correlation results, we made two groups: the first, Bosnia and Herzegovina and North Macedonia, as countries with an increasing share of manufacturing in their GDP, and the second with the other SEE countries, with a trend of deindustrialization, a decreasing share of manufacturing in the GDP over the period considered. For B&H we found a significant and strong positive correlation between MiGDP, GDP and EMM, proving the trend of reindustrialization. For North Macedonia, we found a positive weak correlation between MiGDP and GDP, and negative weak correlation for the others variables.

The second group of SEE countries experienced even more mixed results of correlation between the variables under consideration. Most of them had a negative correlation between the most important variables for the investigation proposed, between the share of manufacturing in GDP (MiGDP) and GDP growth (GDP). Serbia and Montenegro had a strong negative correlation coefficient between these variables (-0.609 and -0.718, respectively), while other countries had a modest negative correlation coefficient. It is interesting to note that this group of SEE countries, except Serbia, had a positive correlation between the share of manufacturing in GDP (MiGDP) and unemployment (UNM), which for some was strong (Montenegro 0.809) and for others weak. Serbia, on the other hand, had a medium strong negative correlation between these variables (-0.504). This can be partially explained by a strong decreasing trend of the share of manufacturing in the GDP, or in other words a strong tendency towards deindustrialization. For this subgroup, correlation coefficients between the share of manufacturing and the total employment and manufacturing employment were rather mixed, strong and weak, positive and negative. Albania had negative relations for both variables, Croatia had both positive correlations, Kosovo and Montenegro mixed, and lastly, Serbia had a positive correlation for both total employment and (very strong) manufacturing employment (0.223 and 0.960).

CONCLUSIONS

Facing its weak position on the global market, together with a trend of deindustrialization, the European Union tried to define the reorientation of its economic structure towards higher manufacturing involvement in the GDP, by adopting a reindustrialization policy. The goal is to achieve 1/5 of manufacturing in its GDP, together with greater involvement of environmentally neutral production, and higher involvement of knowledge and information technologies.

Our research was focused on a comparative analysis of the development characteristics of the South East European countries which used to be part of the unique market of the former Yugoslavia (plus Albania). They had experienced a specific mix of a planned market economy in the past, but for last twenty years tried to fully introduce a market economy. The period under consideration was the last twenty years of transition.

Research into industrial development in SEE countries, measured by the share of manufacturing value added in GDP, pointed to a declining trend, or in other words, deindustrialization. The competitive industrial performance index indicated differences among the SEE countries, a lag in economic development, and a technological gap in relation to EU countries.

Another aim of the study was to find out whether these countries experienced deindustrialization or reindustrialization. Answering the question with regard to achieving the goal of a 20% share of manufacturing in the GDP, our finding is positive. All SEE countries, except Montenegro, have already achieved this goal. At the same time, not many EU countries have achieved this goal. However, the first problem in this regard is that the share of manufacturing in the GDP is decreasing, namely these countries, except Bosnia and Herzegovina and North Macedonia, are faced with a trend of deindustrialization. This has produced a negative outcome for their national balance of payment, as they have fewer and fewer marketable products for the global market. The second problem is that the high share of manufacturing and the tendency of decreasing this share is not a matter of consistent industrial policy, e.g. a reindustrialization policy, but rather a legacy from the past, related to the specific characteristics of the former non-market economy and forced industrialization policy for decades.

All SEE countries experienced a high rate of growth in their GDP in the first decade of the century until the global economic crisis, while less developed countries experienced higher growth rates. Recovery after the crisis was modest and more equal among these countries. A structural path of the recovery perpetuated deindustrialization, as service activities could recover faster and more easily.

All SEE countries faced a high level of unemployment during the last two decades, due to transition shock, restructuring problems in existing companies and a weak SME sector. A positive trend of decreasing unemployment was recognized, especially during the recovery period.

The tendency of manufacturing employment was understandably closely linked to the manufacturing VA share in the GDP. During the period under consideration, it grew faster than the total employment.

The results of the regression analysis for the whole SEE group of countries gave us the equation MiGDP = 801+0.4GDP-0.1UNM+0.2EMT-0.2EMM, with a high value of R^2, which shows that 58% of the total variations in the dependent variable (MiGDP) can be explained by independent variables, and they fit well.

The results of the correlation analysis are in line with previous results. On average, for the whole group of SEE countries, a very strong positive correlation between MiGDP and EMM was found, and a strong negative correlation with EMPT, and at the same time a significant negative correlation with GDP and significant positive correlation with UNM.

Policy makers in SEE countries have to be aware that a decreasing share of manufacturing in the GDP produced a negative outcome in the balance of payment for SEE countries, and in future this will put the share below 1/5 of the GDP (the EU's policy goal). So, the introduction of reindustrialization policy measures could be useful to stop this trend with negative implications, and reshape the trend to an increasing one. It seems that this step, including creating and introducing policy measures, can strengthen the position of these economies on the global market and, more importantly, dismantle a lag in economic development and technological level behind EU countries.

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REFERENCES

Ambroziak, A. A. (2015). Europeanization of Industrial Policy: Towards Re-industrialization? In P. Stanek, K. Wach (Eds.), *Europeanization Processes from the Macro-economic Perspective: Industries and Policies*. Krakow: Cracow University of Economics, pp.61-95.

Bazhal, J. (2017). Innovation Development versus Re-industrialization, In J. Bazhal (Ed.), *The Political Economy of Innovation Development,* Cham: Palgrave Macmillan, pp. 87-99.

Boljanović, S., Hadžić, M. (2017). Impact of Foreign Direct Investments on Serbian Industry, Industry, *Industrija,* Vol. 45, No. 3, pp. 39-64. https://doi.org/10.5937/industrija45-13465

Božić, M. (2009). Deindustrialization in Transition Countries and its Economic Consequences, *Journal for Social Studies/* Teme – časopis za društvene nauke, Vol. 33, No. 2, pp. 423-442.

CEDEFOP (2021). *Coronavirus impact on jobs in EU sectors and occupations: A skills forecast analysis*. European Center for the Development of Vocational Training: News and events [online]. https://www.cedefop.europa.eu/en/news/coronavirus-impact-jobs-eu-sectors-and-occupations-skills-forecast-analysis [Accessed: 10 Mar 2021].

Dabrowski, M., Myachenkova, Y. (2018). The Western Balkans on the road to the European Union, *Policy Contribution*, Issue No. 24, pp. 1-23. https://euagenda.eu/upload/publications/untitled-133335-ea.pdf [Accessed: 10 Mar 2021].

Demekas, D., Horvath, B., Ribakova, E., Wu, Y. (2005). Foreign Direct Investment in South-Eastern Europe: What do the Data Tell us? In K. Liebscher, J. Christl, P. Moosclechner, D. Ritzberger-Grűnwald (Eds.), *European Economic Integration and South-East Europe: Challenges and Prospects*. UK: Edward Elgar, pp. 209-241.

European Commission (2010). *Europe 2020 - A Strategy for Smart, Sustainable and Inclusive Growth*, Brussels: European Commission [online]. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC2020&from=EN [Accessed: 15 Apr 2021].

European Commission (2011). *Industrial Policy: Reinforcing Competitiveness*, Brussels: European Commission [online]. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0642:FIN:EN:PDF [Accessed: 21 Apr 2021].

European Commission (2018). *A Credible Enlargement Perspective for and Enhanced EU Engagement with the Western Balkans*, Brussels: European Commission [online]. https://op.europa.eu/en/publication-detail/-/publication/e3f0797b-28cb-11e8-b5fe-01aa75ed71a1/language-en [Accessed: 30 Apr 2021].

European Commission (2020a). *A New Industrial Strategy for a Globally Competitive, Green and Digital Europe*. Brussels: European Commission [online]. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A102%3AFIN [Accessed: 1 Mar 2022].

European Commission (2020b). *An Economic and Investment Plan for the Western Balkans*. Economic and Social Committee and the Committee of the Regions, Brussels: European Commission [online]. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0641 [Accessed: 5 Mar 2022].

Fisher, S., Sahay, R. (2000). Taking Stock, *Finance and Development*, Vol. 37, No. 3, pp. 2-6.

George, D., Mallery P. (2019). *IBM SPSS Statistics* (6th ed.). New York: Routledge. https://doi.org/10.4324/9780429056765

Hadžić, M., Zeković, S. (2019). Rethinking deindustrialization, and the reindustrialization policy in Serbia, *SPATIUM*, No. 41, pp. 14-22. https://doi.org/10.2298/SPAT1941014H

Kotynkova, M. (2017). Re-Industrialization of Europe: Industry4.0 and the Future of Work, *European Scientific Journal*, pp. 249-257. https://eujournal.org/index.php/esj/article/view/9204/8745

Kozarzewski, P. (2021). State Corporate Control in Polish Transition: Main Outcomes, *State Corporate Control in Transition*, pp. 157-202. https://doi.org/10.1007/978-3-030-78562-8_5

Labus, M. (2020). Transition and Post-conflict Macroeconomic Policies in Serbia, *Economic Annals*, Vol. 65 No. 226, pp. 73-102. https://doi.org/10.2298/EKA2026073L

Lojpur, A. (2016). Reindustrijalizacija kao odgovor na pitanje - da li je i kako moguć oporavak zemalja u tranziciji, *V Scientific Conference with international participation, Jahorina Business Forum* 2016, *Tourism and Competitiveness – Conference proceedings*. Pale: Ekonomski fakultet Pale, Univerzitet Istočno Sarajevo, pp. 25-37.

Mazzucato, M. (2015) Which Industrial Policy does Europe Need? *Intereconomics,* No. 50, pp. 120–155.

Mengoli, P., Russo, M. (2017). A Hybrid Space to Support the Regeneration of Competences for Re-industrialization, Lessons from a Research-Action. In F. Montanari, F. Sgaragli, D. Teloni (Eds.), *Cities as engines of innovation: a transatlantic journey EU-USA,* Dipartimento di Economia Marco Biagi, and Capp – Center for Analysis of Public Policies, Università di Modena e Reggio Emilia, Working paper series, No. 108, pp. 39-55.

Milivojević, S. (2015). Reindustrijalizacija Srbije u cilju jačanja konkurentnosti srpske privrede. In I. Stošić, M. Malović, D.

Filimonović (Eds.), *Strukturne promene u Srbiji – Dosadašnji rezultati i perspektive.* Beograd: Institut ekonomskih nauka , pp. 553-562.

Moczadlo, R. (2020). Re-industrialization to foster growth and employment in the European Union, *Ekonomski vjesnik / Econviews: Review of contemporary business, entrepreneurship and economic issues*, Vol. 33, No. 1, pp. 39-58.

Nawratek, K. (2017). Der Arbeiter (Re-)Industrialization as Universalism?. In K. J. Nawratek (Ed.), *Urban Re-Industrialization,* Punctum Books, pp. 61-68. http://eprints.whiterose.ac.uk/116823/

Neagua, C., Bulearcă, M., Simaa, C., Mărguş, D. (2018). A SWOT Analysis of Romanian Extractive Industry and Re-industrialization Requirements of this Industry, *Procedia Economics and Finance*, Vol. 22, 2015, pp. 287-295. https://doi.org/10.1016/S2212-5671(15)00288-9

Nevskaya, N. A., Garnov, A. P., Brykin, A. V., Malakhova, E. V. (2018). National Competitiveness as the Object of Indicative Planning in the Context of Re-industrialization, *European Research Studies Journal,* Volume XXI, Special Issue 1, pp. 148-155. https://doi.org/10.35808/ersj/1167

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (7th ed.). London: Routledge. https://doi.org/10.4324/9781003117452

Popescu, V. A, Popescu, G. H. N., Popescu, C. R. (2015). Competitiveness and sustainability – a modern economic approach to the industrial policy, *Metalurgija,* Vol. 54, No. 2, pp. 426-428. https://hrcak.srce.hr/128979 [Accessed: 10 May 2022].

Regional Cooperation Council (RCC) (2013). *South East Europe 2020: Jobs and Prosperity in a European Perspective.* Sarajevo: RCC [online]. https://www.rcc.int/files/user/docs/reports/SEE2020-Strategy.pdf [Accessed: 10 May 2022].

Regional Cooperation Council (RCC) (2021). *South East Europe Strategy 2030.* Sarajevo: RCC [online]. https://www.rcc.int/docs/581/south-east-europe-strategy-2030 [Accessed: 10 May 2022].

Rowthorn, R., Ramaswamy, R. (1997). Deindustrialization–Its Causes and Implications, *IMF Working Papers,* Vol. 97, No. 42, Washington, D. C.: IMF. https://www.imf.org/external/pubs/ft/wp/wp9742.pdf [Accessed: 10 May 2022].

Sachs, J. (1998). International Economics: Unlocking the Mysteries of Globalization, *Foreign Policy*, No. 110, Special Edition: Frontiers of Knowledge (Spring, 1998), pp. 97-111.

Savić, Lj., Zeković, S. (2004). Industrijska politika EU-Pouke za zemlje. In N. Milašin, N. Spasić, M. Vujošević, M., Pucar (Eds.), *Strateški okvir za održivi razvoj*. Posebna izdanja 44, Beograd: IAUS, pp. 57-68.

Stiglitz, J. E. (2001). Whither Reforms? Ten Years of the Transition, Paper presented at the Annual World Bank Conference on Development Economics, Washington, DC, April 1999. In H-J. Chang (Ed.), *Joseph Stiglitz and the World Bank: The Rebel Within*, London: Anthem Press, pp. 127-171.

Taplin, I., Ngyen, M. T. T. (2016). From recession to re-industrialization. In J. Begley, D. Coffey, T. Donnelly, C. Thornley (Eds.), *Global Economic Crisis and Local Economic Development, International cases and policy responses*, London: Routledge, pp. 88-14. https://doi.org/10.4324/9781315630328

Zaborova, E., Makarova, E., Kleymenov, M. (2018). Entrepreneurship as the Resource for Re-industrialization, Series: Advances in Social Science, Education and Humanities Research, Vol. 240, *2nd International Scientific Conference on New Industrialization: Global, National, Regional Dimension - Conference Proceedings,* pp. 634-638. https://doi.org/10.2991/sicni-18.2019.128

Zakharchenko, O. V., Eremina, A. R., Ushakov, D. S., Odintsov, O., Mylnichenko, S. M. (2019). Management of Reputation Risks at the Agricultural Enterprises of Eastern Europe as a Component of Increasing their Competitiveness, *Journal of Reviews of Global Economics,* No. 8, pp. 859-872. https://doi.org/10.6000/1929-7092.2019.08.74

Zeković, S., Hadžić, M. (2020). Perspektive nove industrijske politike u Srbiji i njene implikacije. In J. Petrić, M. Vujošević (Eds.) *Teorijska, razvojna i primenjena istraživanja prostornih procesa za obnovu strateškog mišljenja i upravljanja u Srbiji*. Posebna izdanja 88. Beograd: Institut za arhitekturu i urbanizam Srbije, pp. 27-67.

Zeković, S., Vujošević, M. (2015). Development of South-Eastern Europe: The Role of Industrial Policy, *American Journal of Economics, Finance and Management,* Vol. 1, No. 5, pp. 445-459. http://www.aiscience.org/journal/ajefm

United Nations Industrial Development Organization (UNIDO) (2020). *UNIDO Statistics Data Portal*. UNIDO [online]. https://stat.unido.org/database/CIP%202020 [Accessed: 19 May 2022].

World Bank (2021). *Datasets*. World Bank [online]. [Accessed: 19 May 2022].

https://tcdata360.worldbank.org/countries

https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG

https://tcdata360.worldbank.org/indicators/mva.ind.int?country=BRA&indicator=3793&viz=line_chart&years=1990,2014

https://tcdata360.worldbank.org/indicators/h27e52df8?country=BRA&indicator=3787&viz=line_chart&years=1990,2014#comparison-link

https://tcdata360.worldbank.org/indicators/hbe238413?country=BRA&indicator=3794&countries=ALB&viz=line_chart&years=1990,2014.

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RESIDENTIAL SATISFACTION IN LARGE HOUSING ESTATES OF BUDAPEST: IS AGE REALLY JUST A NUMBER?

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With the surge in urban regeneration programs in housing estates in Hungary, there is a need for residents' perceptions of these programs to be understood. This is the first study to be conducted in Hungary and across Central and Eastern Europe to compare residential satisfaction between different age groups within the same city. Thus, this study aimed to investigate whether residential satisfaction differs between the different age groups in the regenerated housing estates in Budapest. The study collected quantitative data from 217 residents living in housing estates that had undergone urban regeneration in Budapest, Hungary. Residential satisfaction was found to differ between age groups within the regenerated housing estates in Budapest. Both the 36–55 and 56+ age group models illustrated that the dwelling unit, housing condition, and housing support satisfaction indices were significant predictors of residential satisfaction. The first age group, 18–35, did not show the dwelling unit satisfaction index to be a predictor, whereas the other two indices were significant in predicting residential satisfaction in Budapest. Further analysis found no correlation between the indices with regard to gender, marital status, or length of residence. Thus, the study adds to the growing corpus of literature on residential satisfaction, especially since most of the extant research has been, up to now, conducted in Western Europe, Africa, and Asia. Furthermore, this study can provide valuable insights for urban planners, urban policymakers, and investors in amending current housing policies and contributing to future housing-led regeneration programs within Hungary.

***Key words*: Residential satisfaction, Hungary, age differences, housing estates.**

INTRODUCTION

Since the 1900s, the world has experienced several housing crises. However, it is only over the past few decades that politicians and other influential stakeholders have taken the concept of a pressing housing crisis seriously. Politicians have often referred to housing as a crisis, an emergency, and a call to action from across the political spectrum. However, contrary to popular belief, the housing crisis is not a straightforward, universally understood and accepted concept, as leading housing stakeholders have created varied narratives. These are what Heslop and Ormerod (2020) referred to as the "dominant narratives" of the housing crisis, whereby the crisis is a basis for specific interventions seen through the lens of discursive analysis. Still, systemic transformation is often dismissed, and the experiences of the poorest are not reflected in the interpretation of the concept of the housing crisis. In simpler terms, the concept of the housing crisis has been used to create opportunities for new policies, which are often regressive, and specific interventions that do not challenge the hegemonic neoliberal housing model. As evident throughout the history of humankind (Engels, 1887), the housing crisis is an established, secular norm to those facing housing inequality. This is despite the notion that the housing crisis may seem to be temporary and departs from the standard norm of housing affordability and adequacy.

The notions of a housing crisis have been deployed to refer to affordability (increases in rent in the private and public housing sectors) and supply or demand; however, it is vital to understand the housing unit as both a home and a financial investment. In unpacking the concept of "housing crisis," various socioeconomic implications also emerge,

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such as the continuous increase of intragenerational and intergenerational inequity, whereby the older generation receives higher salaries, which means that they can purchase homes and generate further wealth to acquire additional properties. This means that rent and housing prices for the younger generation are often too high, unless an inheritance or family support enables some young people to kick-start their adulthood. Expectedly, those with a lower income and those who are younger are, de facto, oftentimes automatically excluded from acquiring wealth, thus increasing the burden on the state to meet their basic housing needs (Morton, 2013; Flynn, 2020; Lutz, 2020). Therefore, this inequity is evidenced between the rich and poor and the young and old.

Relatedly, the construction of large-scale housing estates in Europe was predominant during the postwar period to address the housing shortage after World War II. Although these were similar in both construction methods and urban design, with more emphasis on the quantity than on the quality of the flats, moving into these estates was nevertheless a welcomed upgrade for those who had lived in the decayed inner city (Bolt, 2018). Large-scale housing estates were perceived as "modernist urban and social utopias" (Hess *et al*., 2018, p. 7); however, some two decades later, many of these estates had become associated with prostitution, drug abuse, crime and grime, and other attendant social problems such as mass unemployment and widespread poverty. However, from the onset, it is worth noting that despite the similar goal in constructing housing estates across Europe, these housing systems are often quite diverse in practice, which means that the state-subsidized housing schemes in this continent also show the utmost heterogeneity. For instance, housing estates in Northern and Western Europe were built between the 1950s and 1970s to provide affordable housing to low-income groups (but excluding the poorest of the poor). In Central and Eastern Europe, housing estates were also built over similar periods, but were more prominent in the 1980s and 1990s and targeted at middle- to high-income groups and those deemed deserving of the flats, or plainly "the cream of the crop" (Dekker *et al*., 2005).

The historical (both political and economic) systems that were in place in these countries meant that many high-rise housing developments were constructed in the outskirts of cities. Of course, newer housing estates were built closer to socialist industries, with the Eastern European estates much larger than those of the West (Dekker *et al*., 2005). The dramatic change in economic, social, and political systems meant that most of these estates became unpopular and were relegated, de facto, to the bottom of the housing hierarchy. Engendered by the ever-increasing construction of newer housing in the peripheral areas of the cities, more and more poor people were allocated to the now deteriorating housing estates. Mainly in Northern and Western Europe, many housing estates had similar problems, such as varying degrees of building decay, untidiness in public spaces, increased drug and alcohol abuse, reduced social cohesion, and racial tensions (Dekker *et al*., 2005; Evans, 1998). Despite this, not all housing estates were found to be dysfunctional and socially fragmented, especially when one looks at the estates in Eastern Europe (Dekker *et al*., 2005). Nevertheless, the problems associated with obsolescence and degradation, particularly in Hungary, led to the regeneration of urban spaces. Urban regeneration has been one of the approaches used to meet socioeconomic objectives, address urban decay, and improve social networks, primarily by integrating previously segregated vulnerable groups (Zheng *et al*., 2014). These initiatives have largely been achieved through public-private partnerships and have been widely welcomed in ensuring housing affordability. Therefore, key urban stakeholders must understand the core factors that impact residential satisfaction in these large housing estates, to ensure that future programs can meet the goals, needs, and aspirations of the residents. Particularly, these estates are a melting pot of all age groups; thus, predicting and measuring the residential satisfaction determinants of these different age cohorts will assist in building sustainable communities.

Despite the importance of investigating and measuring residential satisfaction in Hungary, there is little or no published work investigating this area, with a large number of published studies focused instead on Asian, Western, and, recently, on African countries (for instance, see Hadlos, 2021; Weckroth *et al*., 2022; Bandauko *et al*., 2022). Although these studies have contributed significantly to the knowledge and understanding of what determines residents' satisfaction with their residential environment, there is a need for research in other, previously less well-researched countries to test the generalizability of the determinants developed in the better-researched countries. Thus, the present study aims to contribute to the scant literature in Hungary about residential satisfaction, and investigate whether residential satisfaction differs between different age groups in the regenerated housing estates in Budapest. Moreover, this study can provide valuable insights for urban planners, urban policymakers, and investors in amending current housing policies and contributing to future housing-led regeneration programs within Hungary.

Having briefly introduced the topic together with the paper's main aim and objectives, the rest of the paper is structured as follows. The state of the art concerning residential satisfaction theories and models will be critically discussed in Literature review. The methodology applied in this paper is described in Methodology Section, with the results being reported in Findings. Finally, Discussion provides some recommendations and a few concluding remarks.

LITERATURE REVIEW

Satisfaction is the level of contentment that an individual may have concerning consuming a product or service (Shum and Ghosh, 2022). Various theoretical approaches have been developed to model consumer satisfaction. Earlier approaches to the study of satisfaction include the contrast theory, assimilation theory, and the negative theory, whereas examples of the later approaches include the European Customer Satisfaction Index, value percept theory, and equity theory (Srivastava and Beri, 2016). The expectancy–disconfirmation satisfaction model is a widely applied model used to explain (dis)satisfaction, proposed by Oliver (1977). It is based on the work of Howard and Sheth (1969), which suggests that satisfaction is the degree

of congruence between the individual's aspirations and the perceived realities of experience. In this, consumers form prepurchase expectations of a product for which this expectancy level then becomes a standard upon which the desire for subsequent purchases is formed. The expected level is then compared with the actual performance level after the purchase of the product. If the judgment that results from the actual performance matches the expected level, confirmation occurs. However, negative disconfirmation occurs if the product's performance is worse than initially expected. This model is similar to the actual–aspiration gap, whereby a resident cognitively constructs a reference quality of a housing feature that will act as an ideal standard, depending on their self-assessed needs and aspirations (see also Pagani *et al*., 2021). If the actual housing feature is perceived to be in close congruity to the reference quality, then residents attain satisfaction. However, if the mental picture of the housing quality that the resident had does not reach the 'threshold deficiency', or rather, the lowest level of satisfaction, residents will either lower their expectations and aspirations, or a degree of dissatisfaction will be engendered (Galster, 1987). This theory is also known as the psychological construct theory.

From the definition of satisfaction, residential satisfaction can then be defined as the level at which a residential environment meets the perceived needs and aspirations of the resident. The residential environment must be understood in its three main dimensions: the residents as the subjective part of the system, the objective attributes of the physical environment, and the satisfaction, which is the regulator of this dynamic relationship (Jiboye, 2012). Three main housing theories have been markedly associated with residential satisfaction models: psychological construct theory, housing needs, and the housing deficit. Most relevant to this research is the housing deficit theory, which was developed by Morris and Winter (1975) to explain how families continuously evaluate the condition of their housing based on their own social and cultural norms. These authors went further, to postulate that a housing deficit would be said to exist if residents were continuously dissatisfied with their physical environment. In this scenario, the housing deficit is not referred to as the lack of housing to accommodate people, but as the perceived poor condition of their housing. Residents assess and then compare the condition of their housing with that of their neighbors via sociocultural benchmarks. If a resident finds that the difference between their benchmark and the material housing condition is too wide, this will result in housing dissatisfaction, which tends toward (1) residential mobility, (2) residential adaptation, or (3) a change in housing composition (Morris and Winter, 1975).

Although scholars and practitioners investigate, measure, and predict residential satisfaction differently, urban planners and architects often focus on the dwelling units, housing conditions, and housing support services. Thus, to meet the aim of the study, these three determinants are the key elements in the present study.

Dwelling unit features

Housing characteristics are crucial determinants, as studies have shown that dwelling unit features such as enough space in the house, bedroom size, location of the bathroom, appearance of the flat, and overall build quality are strongly related to residential satisfaction or dissatisfaction. These physical dwelling characteristics are essential for accurately and definitively evaluating one's housing situation. Negative opinions formed out of these factors may prompt mobility because of the unit not meeting the tenant's needs, whereas positive perceptions of the unit encourage continued residence. For instance, previous studies have shown that residents almost always seek dwellings that have enough space to meet the household's needs (Lu, 1999). Therefore, the person-per-space ratio and residential satisfaction have a negative relationship as the higher the density of the living environment, the more residential satisfaction decreases (Dekker *et al*. 2011). In a study conducted by Buys and Miller (2012) in Australia, overall residential satisfaction was found to be dependent on a certain set of dwelling and neighborhood attributes, such as the location of the dwelling and the dwelling design characteristics (e.g., size, storage space, and sustainability considerations).

Housing conditions features

Based on the effectiveness model developed by Duncan (1971), the quality of housing conditions is categorized into three dimensions: the interior features of the dwelling unit, the exterior of the dwelling unit, and the surrounding area. Residential satisfaction is also derived from satisfaction with a given flat's build quality and its current condition. However, the construction of housing for low- to middle-income groups is very rarely developed to address the actual needs and types of the inhabitants (McCray and Day, 1977). This is mainly due to the quality elements of a building seldom being considered for these families. In this, Aigbavboa (2014) argued that to achieve quality in low-cost housing, there should be a combination of the residents' needs and the overall principles to act as a guide in building adequate housing. However, affordable housing is often built on limited government money, with the poor and (previously) disadvantaged often being the targeted beneficiaries. Because of the limited budget, the cost and design of the construction of this housing are usually compromised. Therefore, a building with suitable quality materials and design is an important indicator that could determine future residential satisfaction in the incoming residents.

Construction of affordable housing is inherently a complex process; therefore, a wide range of technical, functional, and aesthetic issues need to be explored to determine residential satisfaction by evaluating building performance. Jiboye (2012) posited that the prospects of the housing sectors depend on the residents' satisfaction with the dwelling as soon as they move in, and continue throughout the life cycle of the entire building. Hence, planners and developers must understand the needs and expectations of the residents and how these concerns can be met realistically (Lu, 1999). Elsinga and Hoekstra (2005) suggested that the housing quality should not be assessed using just one variable, as

factoring in the subjective and objective dimensions would offer a broader understanding of resident satisfaction or dissatisfaction. Building quality features that contribute to residential satisfaction include the internal and external building quality, window/wall/door/floor/plumbing quality, and the number and physical positioning on the wall of the electrical sockets.

Housing support features

The relationship between government departments and those external stakeholders responsible for the flats and the residents greatly influences overall residential satisfaction. Some important determinants in residential satisfaction are maintenance, rubbish collection, the drainage system, fire protection services, water supply, electricity supply, and rules and regulations within the housing estates. The time the management takes to address complaints raised by tenants also influences residents' satisfaction with their dwelling. For instance, Cho (2020) found that management and service factors positively influenced residential satisfaction in welfare housing facilities exclusively built for low-income, single-mother households in South Korea.

Sociodemographic characteristics

Several sociodemographic characteristics have been studied as mediating factors in predicting residential satisfaction. These oftentimes include age, education level, length of residence, gender, number of people in the household, marital status, income level, and number of dependents. However, the influence they have on residential satisfaction varies across the extant literature; thus, contrasting results are reported. For instance, Lu (1999), Morris and Winter (1975), and Chapman and Lombard (2006) have shown that age has a positive effect, as older residents tend to be more satisfied with their residence compared with their younger counterparts. However, Jun and Jeong (2018) found that the age of the households is negatively related to residential satisfaction. Although these studies provided valuable information regarding the influence of age on the overall satisfaction of a neighborhood, they did not study residential satisfaction in the different age groups. This is vital, as residents in a specific neighborhood within the same age group often have similar experiences and values. In this, older residents are more satisfied as they are more tolerant of their neighborhood shortcomings (Galster, 1987), whereas younger residents are often dissatisfied with their neighborhood, which may be due to this cohort's higher aspirations and needs. Interested in determining how age variance affects housing aspirations in Nigeria, Waziri *et al.* (2014) found that the 50–60 age group was more satisfied compared with other age groups. In another study in Bangladesh, younger residents were found to be more dissatisfied with their residential environment than older residents (Mridha, 2020).

METHODOLOGY

Case study

This cross-sectional study was conducted to investigate the relationship between residential satisfaction and community sense in Budapest housing estates. As the capital of Hungary,

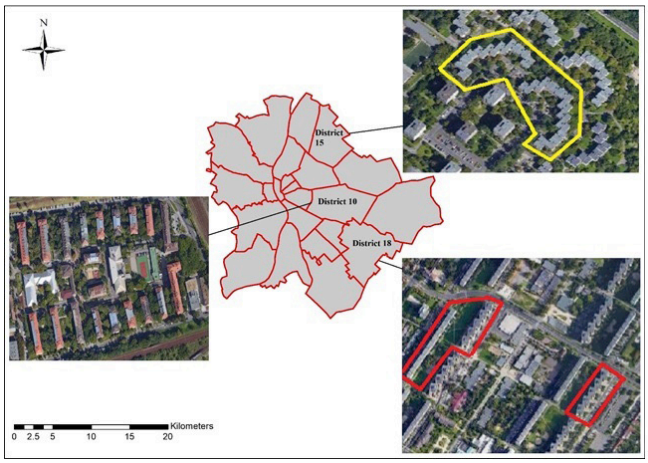

Figure 1. Location of the housing estates covered in the study within Budapest
(Source: Author, 2022)

Budapest has 23 districts, with approximately 1,723,836 inhabitants spanning 525 km^2. To address the aim of the manuscript, only housing estates that completed urban regeneration programmes with a focus on both physical and social infrastructures were included (Figure 1). These were low-rise housing estates Kis-Pongrác (77 respondents) in district 10 and Újpalota (46 respondents) in the 15th district, while the high-rise estate was Havanna (90 respondents), located in the 18th district, which all have similar, low crime rates compared to inner-city districts. The programmes resulted from extensive public-private partnerships that generally included bottom-up initiatives, funded by the EU as a social regeneration programme, municipal interventions, and the national panel programme. Specifically, all the housing estates have similar socio-environmental variables such as green spaces, community spaces, shopping centres, healthcare services, and other services provided by various stakeholders such as the local municipality. Notably, the manuscript's focus was not to compare the results of the different housing estates, but rather to gain the different residents' opinions and then investigate and compare these results in different housing estates typologies.

Questionnaire design

The data were part of a larger doctoral research project that utilized a multistage sampling technique, i.e., clustering and random sampling techniques to explore whether there was a significant age difference in satisfaction with the residential environment after the implementation of urban regeneration programs in Budapest, Hungary. The data were collected in the Hungarian language, with the help of research assistants, during the summer of 2021. The minimum age to participate in the study was 18 years, with verbal consent required before completion of the questionnaire could be addressed. The questionnaire first introduced the main researcher and the purpose of the research, and then emphasized that residents were under no obligation to participate, they would receive no monetary benefits for participating, and they may decide to terminate completion of the questionnaire and not face any consequences nor be discriminated against. The questionnaire took approximately 15 minutes to complete. The questionnaire

Table 1. Independent variables of the questionnaire

Dwelling unit (DU)	Housing condition (HC)	Housing support (HS)	Sociodemographic
DU1–Number of rooms	HC1–Exterior quality	HS1–Sewer system	Age
DU2–Apartment size	HC2–Interior quality	HS2–Waste disposal	Gender
DU3–Privacy level	HC3–Sanitary quality	HS3–Fire protection	Marital status
DU4–Natural light	HC4–Plumbing quality	HS4–Water supply	Length of residence
DU5–Ventilation quality	HC5–Interior painting	HS5–Power supply	
DU6–Floor level quality	HC6–Number of electrical sockets	HS6–Gas supply	
DU7–Physical appearance of the apartment	HC7–Location of electrical sockets	HS7–Joint representation/ housekeeping	
DU8–Flat's natural temperature in summer	HC8–Quality of doors	HS8–Mobile/internet service coverage	
DU9–Flat's natural temperature in winter	HC9–Quality of windows		
	HC10–Quality of walls		
	HC11–Quality of floor coverings		
	HC12–Heating system		

sought to measure three main components (determinants) of residential satisfaction: (1) residents' satisfaction with their dwelling unit, (2) the condition of their housing, and (3) housing support features. Each component of residential satisfaction is represented by a larger number of variables (Table 1). Respondents indicated how satisfied they were with the researched variables on a scale from 1 (least satisfaction, i.e. dissatisfaction) to 5 (highest satisfaction). Sociodemographic variables were also collected (Table 1).

Data analysis

Several statistical analyses were conducted to achieve the goal of the present research. Before any analysis could begin, data entry was performed, which consisted of moving raw data from paper format into Microsoft Excel. Thereafter, the spreadsheets were imported into the Statistical Package for Social Sciences (SPSS, version 27) for statistical analyses. Descriptive statistics were calculated, and then, to measure the scores of residential satisfaction in Budapest, three indices were used.

First, the satisfaction index (SI) calculates the satisfaction index of each specific component that was developed by Onibokun (1974). It is understood that the total score of all the variables within a specific component indicates if respondents are satisfied or dissatisfied with that component. Thus, this index builds on the habitability indices that were calculated in the previous step. Equation 1 is provided below:

$$SI_X = \frac{\sum_{i=1}^{N} yi}{\sum_{i=1}^{N} Yi} \times 100 \qquad \textit{Equation 1}$$

where SI is the index of relative satisfaction of a tenant with a specific given component (x); N is the number of variables selected for scaling under x; yi is the actual score by a respondent on the ith variable; and Yi is the maximum score that variable i could have on the scale used (Onibokun, 1974, p. 192).

Second, the residential satisfaction index (RSI) calculates a respondent's residential satisfaction in all the components in the questionnaire (Onibokun, 1974). This is mathematically expressed in Equation 2:

$$RSI_m = \frac{\sum_{i=1}^{N_1} d_i + \sum_{i=1}^{N_2} hs_i + \sum_{i=1}^{N_3} hc_i}{\sum_{i=1}^{N_1} D_i + \sum_{i=1}^{N_2} HS_i + \sum_{i=1}^{N_3} HC_i} \times 100 \qquad \textit{Equation 2}$$

where RSI_m is the satisfaction index of a respondent with the residential satisfaction model. N1, N2, and N3 are the numbers of variables selected for scaling under the dwelling unit, housing support services, and housing condition components, respectively. d_i, hs_i, and hc_i represent the actual score of a respondent on the ith variable in the component. D_i, HS_i, and HC_i are the maximum score of the variable i in terms of the dwelling, housing support, and housing condition components, respectively.

Lastly, the habitability index (HI) is used to calculate the exact variables of the components to find out the degree to which they contributed to the satisfaction or dissatisfaction of the resident. This index was introduced by Ogu (2002), and it calculates the indices separately rather than in combination. In other words, based on the scores (1–5) that respondents assigned to each variable, these are totaled and then divided by the sum of the maximum possible score for that specific variable. This is then multiplied by 100. Equation 3 is illustrated below:

$$HIx = \frac{\sum_{i=1}^{N} a\acute{y}x}{\sum_{i=1}^{N} A\acute{y}x} \times 100 \qquad \textit{Equation 3}$$

where HIx represents the index of habitability of variable x, N is the number of respondents (217), and $a\acute{y}x$ is the actual score on the 5-point scale by the ýth respondent on the xth variable. "A" represents the maximum possible score that respondent "ý" could give to variable x on a 5-point scale (Ogu, 2002, p. 44).

The third stage included the running of normality tests, whereas the fourth and final stages included the correlation analysis and the regression modeling.

FINDINGS

Descriptive statistics

Table 2 presents the sociodemographic information of the respondents. Of the total 217 respondents, 126 (58.1%) identified as women, and 73 (33.6%) had a university

Table 2. Descriptive statistics of respondents

Variables	Total N = 217 n (%)	18–35 N = 50 n (%)	36–55 N = 94 n (%)	56+ N = 73 n (%)
Gender				
Female	126 (58.1)	25 (50)	48 (51.1)	53 (72.6)
Male	90 (41.5)	24 (48)	46 (48.9)	20 (27.4)
Other	1 (0.5)	1 (2)	0	0
Marital status				
Single	57 (26.3)	22 (44)	26 (27.7)	9 (12.3)
Married	85 (39.2)	19 (38)	39 (41.5)	27 (37)
Cohabiting	27 (12.4)	9 (18)	15 (16)	3 (4.1)
Widowed	29 (13.4)	0	3 (3.2)	26 (35.6)
Divorced /living separately	19 (8.8)	0	11 (11.7)	8 (11)
Length of residence				
<5 years	76 (36.4)	36 (72)	33 (35.1)	10 (13.7)
6–10 years	35 (16.1)	9 (18)	23 (24.5)	3 (4.1)
11–15 years	26 (12)	2 (4)	17 (18.1)	7 (9.6)
16–20 years	15 (6.9)	1 (2)	6 (6.4)	8 (11)
>20 years	62 (28.6)	(4)	15 (16)	45 (61.6)

qualification. The majority (39.2%) were also married, as compared with the 8.8% who were either living separately or divorced.

Internal consistency test

The internal consistency of the different components of the questionnaire was measured using Cronbach's alpha. This tool measures the degree to which an instrument (i.e., a questionnaire) produces the same results if the exact measurement is repeated. It is the most widely used method to measure the internal consistency of an instrument with scores above 0.70 and is often said to have high reliability. The scores were as follows: 0.787 for the dwelling unit, 0.888 for housing condition and 0.786 for housing support services.

Satisfaction with housing estates

The distribution quartiles of the satisfaction indices illustrate that all age groups were moderately satisfied with all the study's components, except for the age group 56+ in which 53.4% and 46.6% of the residents were highly satisfied with the dwelling unit satisfaction index (DUSI) and housing conditions satisfaction index (HCSI), respectively (Figures 2–5). Similarly, a few people were overly dissatisfied with the HCSI as compared with none for DUSI, housing support services index (HSSI), and residential satisfaction index (RSI).

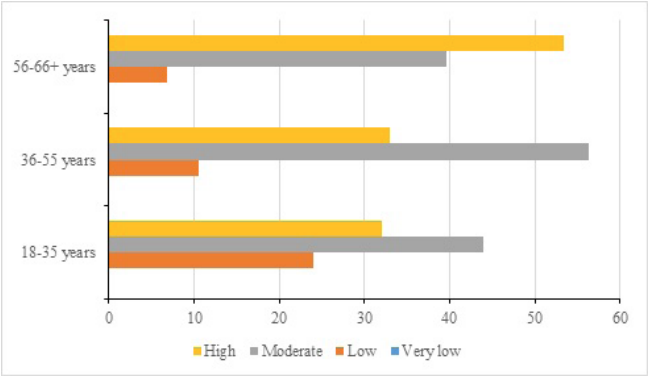

Figure 2. Dwelling unit satisfaction index (Source: Author, 2022)

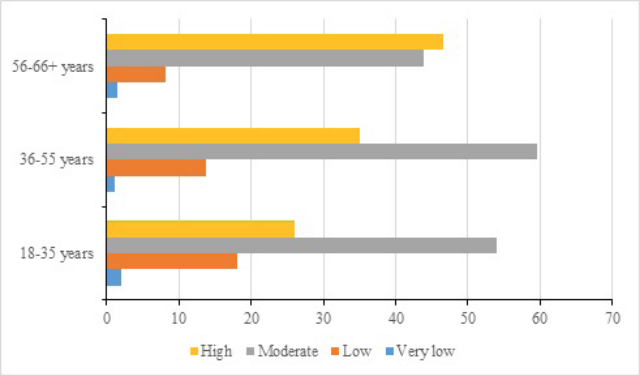

Figure 3. Housing conditions satisfaction index (Source: Author, 2022)

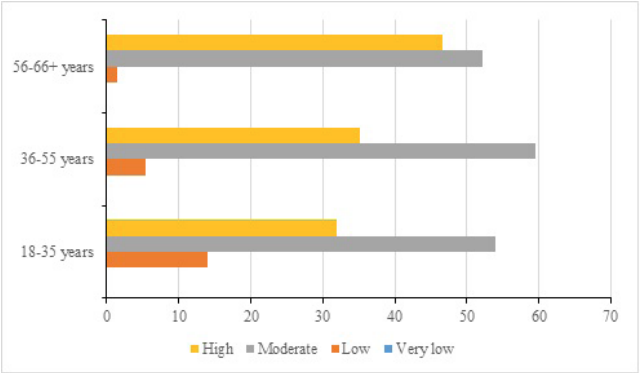

Figure 4. Housing support satisfaction index (Source: Author, 2022)

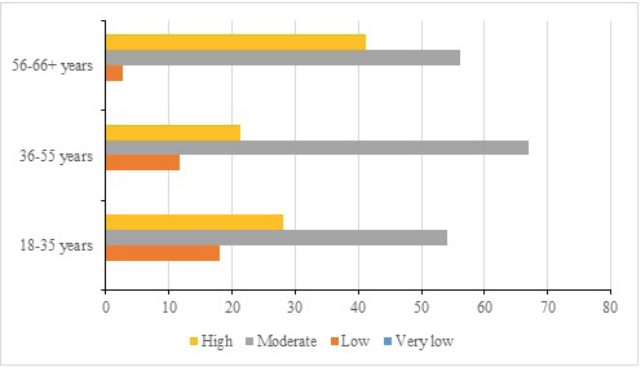

Figure 5. Overall residential satisfaction index (Source: Author, 2022)

Regarding the HI, the variables in all the components were ranked from largest to smallest (Table 3).

Table 3. HI rank ordering of all the variables

18–35		36–55		56+	
Variable	*HI*	*Variable*	*HI*	*Variable*	*HI*
D4	78	D4	78.5	D4	80
D3	77.2	HS5	77	D3	79.5
HS5	76.4	D5	76.4	D2	79.2
D7	75.2	HS6	76.2	HS8	78.9
D5	74.8	D7	76	D1	78.4
HC6	74.8	HC9	74.9	D5	77.8
HS6	74.8	HS8	74.3	HC1	77.8
HC3	73.2	HS4	73.8	HS5	77.5
HC9	72.8	HC1	73.8	D7	77.3
HS4	72.8	D6	73.8	D6	77.3
HS3	72.4	D3	73.6	HC8	77.3
D1	72	D1	73.4	HS2	77.3
HS8	72	D2	73	HC3	77
HC7	71.2	HC4	72.1	HC12	76.4
HC5	70.8	HS3	71.3	HS6	76.2
HC8	70.8	HS1	71.3	HC9	76.2
HC4	69.6	HS7	71.3	HS4	76.2
HS1	69.6	HC6	71.1	HC5	76.2
D2	69.2	HC3	70.9	D9	76.2

The highest HI score across the age groups was D4 (natural light), with D3 (privacy level) being the second highest in the 18–35 (77.2%) and the 56+ (79.5%) cohorts. Similarly, all age groups were the least satisfied with the D8 (flat's natural temperature in summer). On the one hand, regarding the housing condition variables, the 56+ residents were highly satisfied with HC1 (exterior quality) (77.8%) as compared with the 36–55 (73.8%) and 18–35 (69.2%) groups. On the other hand, the 36–55 age group were highly satisfied with HS5 (power supply) (77%), followed by the 18–35 (76.4%) group and the 56+ (77.5%) group when ranked. No variable scored more than 80% or lower than 60%, thus supporting the satisfaction index, in that all groups were moderately satisfied with their dwelling unit, housing conditions, and housing support services.

Preanalysis tests

Before the next analysis steps could be taken, normality tests were conducted to determine if the dataset was normally distributed or not. This valuable information would then determine whether parametric or nonparametric tests for comparing two or more groups were required. Both the Kolmogorov–Smirnov and Shapiro–Wilk normality tests were computed in SPSS, although the results of the Shapiro–Wilk test were mostly deployed because of its power intensity (Razali and Wah, 2011). Table 4 illustrates that the p-value was less than 0.05, which meant that the data were not normally distributed. Specifically, the "18–35," "36–55," and "56+" age groups were the independent variables, whereas the RSI for the total dataset was the dependent variable.

As a result of the above results, nonparametric tests were conducted based on the assumption that the dataset was "distribution-free." The Kruskal–Wallis test was conducted, as it is used to check if there is a significant difference between three or more groups within an independent variable (MacFarland and Yates, 2016). Results suggest that there is a statistically significant difference ($p < 0.002$, $df = 2$, test statistic = 12.320) between the mean ranks of at least one group of the age variables. Dunn's pairwise comparisons of the category of age suggest that sample 3 (56+) has a higher median than samples 1 (18-35) and 2 (36-55) (Table 5).

Correlation analysis

Keeping in line with nonparametric tests, the Spearman rank correlation coefficient was used because of its ability to measure the statistical relationship between two variables. In this, it measured the relationship between RSI and the sociodemographic variables, in combination with the already calculated SI. The HCSI had the highest correlation with the RSI, followed by the DUSI and the HSSI, whereas age had the least positive correlation with residential satisfaction. The results of the intercorrelation between the components show that there is a relatively strong correlation. The correlation of the HSSI ranked the lowest positive with age, followed by the HCSI, with the DUSI reporting the highest correlation. There was no correlation found between the listed variables and gender, marital status, or length of residence (Table 6).

Regression analysis

Stepwise multiple linear regression (MLR) was used to estimate the simultaneous effects of the satisfaction indices' components (DUSI, HCSI, and HSCI) to explain the variance within residential satisfaction. Three models, for the age groups, were executed. The higher the beta weight, the more the variable contributes to predicting residential satisfaction. Similar results can be seen in Table 7, whereby the HCSI in each of the models was the most significant contributor. In both the 36–55 and 56+ age models, DUSI

Table 4. Normality tests for dataset

		Kolmogorov–Smirnov[a]			*Shapiro–Wilk*		
Residential Satisfaction Index	Age	Statistic	df.	Significance	Statistic	df.	Significance
	18–35	0.142	50	0.014	0.935	50	0.009
	36–55	0.107	94	0.010	0.974	94	0.056
	56+	0.136	73	0.002	0.888	73	0.000

a. Lilliefors Significance Correction

Table 5. Dunn's pairwise comparisons test of three categories of age

Sample 1–Sample 2	Test statistic	Std. error	Std. test statistic	Significance	Adjusted significance
1–2	78	D4	78.5	D4	80
1–3	77.2	HS5	77	D3	79.5
2–3	76.4	D5	76.4	D2	79.2

Table 6. Spearman rank correlation coefficients between RSI, SI, and socioeconomic variables

	DUSI	**HCSI**	**HSSI**	**Age**	**Gender**	**Marital status**	**Length of residence**
DUSI		0.634**	0.470**	0.207**			
HCSI			0.527**	0.179**			
HSSI				0.147*			
RSI	0.825**	0.912**	0.710**	0.197**			

** Correlation is significant at the 0.01 level (two-tailed).*
*** Correlation is significant at the 0.05 level (two-tailed).*

was the second-highest contributing predictor, whereas in the 18–35 age group, this was not significant at all. However, the HSCI in this model was the highest when compared with the other models. The R^2 of all three models indicates that 100% of the variance in residential satisfaction was explained by the models.

Table 7. Multiple linear regression per age group.

	18–35		36–55		56+	
	Beta	Sig.	Beta	Sig.	Beta	Sig.
DUSI			0.325	0.000	0.416	0.000
HCSI	0.706	0.000	0.539	0.000	0.617	0.000
HSCI	0.419	0.000	0.293	0.000	0.252	0.000
	R = 1.0 R^2 = 1.0 Std. error = 0.000 df = 46		R = 1.0 R^2 = 1.0 Std. error = 0.000 df = 90		R = 1.0 R^2 = 1.0 Std. error = 0.000 df = 69	

DISCUSSION

This study sought to investigate whether residential satisfaction differs between different age groups within regenerated housing estates in Budapest. The findings suggest that age is not just a number in housing estates, as there is a significant difference in the residential satisfaction experienced by residents belonging to different age groups.

Similar to the present findings, older residents have a much higher residential satisfaction when compared with the younger occupants.

Dwelling unit features

Findings from the satisfaction indices suggest that the older residents (56+ years) were highly satisfied with their dwelling unit, whereas the other residents were largely satisfied. Particularly, the HI scores show that older residents were satisfied with the natural light, the level of privacy, and the size of the apartment. This supports Rojo Perez *et al.*'s (2001) findings, in which older adult residents of Madrid were found to be highly satisfied with dwelling variables such as the size and natural light of the apartment. However, it is worth noting that overcrowding may not be an inconvenience for older adults as they mostly live alone. According to Eurostat data (2017), compared with the 32.1% EU average, approximately 38.8% of those over the age of 65 years in Hungary live alone. From this, it is unsurprising to find that older adults are more satisfied than those aged between 18 and 35 years. Younger residents are less satisfied with their dwelling units for various reasons. First, approximately 46.4% of this age bracket in Hungary currently live with their parents by self-defined current economic status, with the sharing of space possibly causing feelings of overcrowding and limited privacy, thus increasing dissatisfaction (Eurostat, 2022). It should be mentioned that in the present study, this age group was satisfied with the privacy level in the apartment, thus contradicting previous studies in Serbia (Milić and Zhou, 2018), the USA, and Turkey (Kaya and Weber, 2003). Second, although older residents may be more satisfied with the dwelling unit because of their association of the place with fond memories (Neisser, 1988), younger residents have fewer fond memories of their place of residence, and are thus unable to overlook certain variables in their apartment. At the same time, the present findings show that the middle age group reported a higher level of satisfaction than younger people. There may be two reasons for this: first, those between 36 and 55 years old are often financially stable and can afford to improve the quality of their housing if they want to, or simply move to another location, and second, as argued by Golant (1984), the increasingly high satisfaction of the middle and the older age groups may indicate that housing aspirations and preferences may indeed alter with age. Finally, a look at the MLR results suggests that the satisfaction index of the dwelling unit was not a predictor in the 18–35 group, whereas it was a major positive influence in the 56+ followed by the 36–55 age groups.

Housing condition features

In all the age groups, the housing condition satisfaction index was a significant predictor of residential satisfaction. In the youngest age group, this index was the most significant when compared with the middle and older age groups. However, similarly to the DUSI, this group had the relatively lowest satisfaction with the condition of their housing. Interestingly, the 36–55 age group scored the lowest with regard to the quality of the walls, doors, number of electrical sockets, and sanitary conditions. This may be because this group is predominantly working class, and thus, they have numerous mental and physical workloads, and they do not have the patience or the frame of mind to adopt coping mechanisms to increase their satisfaction with these

qualities. This factor is most likely to induce the middle age group to move to better-quality accommodation, especially those residents with children (Gibler and Tyvimaa, 2015).

Housing support services

Findings from the housing support services, or management features, in the MLR showed that it was the most significant predictor in the first age group, followed by the middle age group and then the older adults. Satisfaction index scores suggest that those in the 18–35 age group are more dissatisfied with housing support features compared with their counterparts. For instance, this group achieved a lower score for satisfaction with the water supply. Similar results have been confirmed in Latvia when Krūmiņš *et al*. (2018) investigated how both mobility and static factors affect young individuals' assessment of residential satisfaction. They found that although the quality of the water infrastructure was a predictor in both the 18–34 and 35+ age groups, it was higher with the latter. Regarding their satisfaction with the joint representation of the housing blocks, the 18–34 group was the least satisfied. There may be two main reasons for this. First, older people are often less negative about their living conditions, which may be as a result of them "making do with what they have" perhaps because of the limited opportunities, intentional or otherwise, to move elsewhere. In this sense, the older a resident gets, the higher the chances that environmental stress would not disconcert them much, due to perhaps having experienced much more difficult issues in the past (Granbom *et al*., 2021). Second, during the data collection, the researcher discovered that younger residents were more vocal about their issues, which leads to the assumption that they knew the responsibilities of the joint representation and often raised their grievances with them.

CONCLUSION

In the current study, residential satisfaction was found to differ between different age groups within regenerated housing estates in Budapest. Both the 36–55 and 56+ age group models illustrated that the dwelling unit, housing condition, and housing support satisfaction indices were significant predictors of residential satisfaction. The first age group, 18–35, did not find the dwelling unit satisfaction index to be a predictor, whereas the other two indices were significant in predicting residential satisfaction. Thus, age is not just a number when it comes to residential satisfaction, as significant differences do exist. This study is the first empirical evidence of identified age differences in residents' satisfaction with their residential environment in Hungary. It also contributed significantly to the growing literature on the topic using a Hungarian sample, thus improving the extant knowledge base from Central and Eastern Europe. Furthermore, with the surge in urban regeneration programs in Hungarian housing estates, it is hoped that these research findings are of interest to key stakeholders, in order to address residential satisfaction among the residents. Despite these contributions, some study limitations exist. First, no causality relationship could be inferred from the cross-sectional study design. Second, although the study sample has shed light on the satisfaction of neighborhoods, the sample size may limit the generalization of the study results. Third, the data were only collected in Budapest, with future research being advised to compare the current findings with those of other cities in Hungary such as Pécs, Debrecen, and Szeged.

To conclude, urban regeneration programs can transform urban neighborhoods, revitalize public spaces, and improve the residents' quality of life. To have a greater, long-lasting impact, a needs assessment or, rather, a Social Impact Assessment should be conducted during the planning phases of the programs to identify, address, and monitor the positive and negative impacts of the programs on the communities.

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REFERENCES

Aigbavboa, C. O. (2013). *An integrated beneficiary centred satisfaction model for publicly funded housing schemes in South Africa* (Doctoral dissertation, University of Johannesburg, Johannesburg, South Africa).

Bandauko, E., Kutor, S. K., Nyantakyi-Frimpong, H., Baiden, P., Arku, G. (2022). Influence of socio-demographic factors and housing characteristics on satisfaction with privacy in gated communities in Accra (Ghana), *Housing Studies*, pp. 1-22. https://doi.org/10.1080/02673037.2022.2077920

Bolt, G. (2018). Who Is to Blame for the Decline of Large Housing Estates? An Exploration of Socio-Demographic and Ethnic Change. In D. B. Hess, T. Tammaru, M. van Ham (Eds.), *Housing Estates in Europe: Poverty, Ethnic Segregation and Policy Challenges*. Cham: Springer. pp. 57-74.

Buys, L., Miller, E. (2012). Residential satisfaction in inner urban higher-density Brisbane, Australia: role of dwelling design, neighbourhood and neighbours, *Journal of Environmental Planning and Management*, Vol. 55, No. 3, pp. 319-338. https://doi.org/10.1080/09640568.2011.597592

Chapman, D. W., Lombard, J. R. (2006). Determinants of neighborhood satisfaction in fee-based gated and nongated communities, *Urban affairs review*, Vol. 41, No. 6, pp. 769-799. https://doi.org/10.1177/1078087406286716

Cho, M. (2020). Residential satisfaction among low-income single-mother households: the case of residential welfare facilities in South Korea, *Archnet-IJAR: International Journal of Architectural Research*, Vol. 14, No. 3, pp. 359-378. https://doi.org/10.1108/ARCH-09-2019-0218

Dekker, K., Hall, S., van Kempen, R., Tosics, I. (2005). Restructuring large housing estates in European cities: an introduction. In R. van Kempen, K. Dekker, S. Hall, I. Tosics (Eds.), *Restructuring large housing estates in Europe*, Vol. 1, Bristol: The Policy Press, pp. 1-18.

Duncan, T. L. C. (1971). *Measuring housing quality: a study of methods (No. 20)*. Birmingham: University of Birmingham Centre for Urban & Regional Studies.

Elsinga, M., Hoekstra, J. (2005). Homeownership and housing satisfaction, *Journal of housing and the built environment*, Vol. 20, No. 4, pp. 401-424. https://doi.org/10.1007/s10901-005-9023-4

Engels, F. (1887). *The Housing Question*. Moscow: Progress Publishers.

Eurostat (2017). *A look at the lives of the elderly in the EU today*, Luxembourg: European Commission, Eurostat [online]. https://ec.europa.eu/eurostat/cache/infographs/elderly/index.html [Accessed: 27 Jan 2022].

Eurostat (2022). *Share of young adults aged 18-34 living with their parents by self-defined current economic status - EU-SILC survey*, Luxembourg: European Commission, Eurostat [online]. https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do [Accessed: 27 Jan 2022].

Evans, R. (1998). Policy Review Tackling Deprivation on Social Housing Estates in England: An Assessment of the Housing Plus Approach, *Housing Studies*, Vol. 13, No. 5, pp. 713-726. https://doi.org/10.1080/02673039883182

Flynn, L. B. (2020). The young and the restless: housing access in the critical years, *West European Politics*, Vol. 43, No. 2, pp. 321-343. https://doi.org/10.1080/01402382.2019.1603679

Galster, G. (1987). Identifying the correlates of dwelling satisfaction: An empirical critique, *Environment and Behavior*, Vol. 19, No. 5, pp. 539-568. https://doi.org/10.1177/00139165871950

Gibler, K. M., Tyvimaa, T. (2015). Middle-aged and elderly Finnish households considering moving, their preferences, and potential downsizing amidst changing life course and housing career, *Journal of Housing for the Elderly*, Vol. 29, No. 4, pp. 373-395. https://doi.org/10.1080/02763893.2015.1055029

Golant, S. (1984). *A Place to Grow Old: The Meaning of Environment in Old Age*. New York: Columbia University Press.

Granbom, M., Nkimbeng, M., Roberts, L. C., Gitlin, L. N., Taylor, J. L., Szanton, S. L. (2021). "So I am stuck, but it's OK": residential reasoning and housing decision-making of low-income older adults with disabilities in Baltimore, Maryland. *Housing and Society*, Vol, 48, No. 1, pp. 43-59. https://doi.org/10.1080/08882746.2020.1816782

Hadlos, A. (2021). Determining the depth of households' participation influencing the level of their residential satisfaction in a post-Haiyan resettlement, *International Journal of Disaster Risk Reduction*, Vol. 64, No. 102490. https://doi.org/10.1016/j.ijdrr.2021.102490

Heslop, J., Ormerod, E. (2020). The politics of crisis: Deconstructing the dominant narratives of the housing crisis, *Antipode*, Vol. 52, No. 1, pp. 145-163. https://doi.org/10.1111/anti.12585

Hess, D. B., Tammaru, T., van Ham, M. (2018). Lessons learned from a pan-European study of large housing estates: Origin, trajectories of change and future prospects. In D. B. Hess, T. Tammaru, M. van Ham (Eds.), *Housing Estates in Europe: Poverty, Ethnic Segregation and Policy Challenges*. Springer Nature, pp. 3-31.

Howard, J. A., Sheth, J. N. (1969). The theory of buyer behavior. In M. J. Baker (Ed.), *Critical perspectives on business management*. London: Routledge, pp. 81-105.

Hungarian Central Statistical Office (2021). *22.1.2.1. Resident population by sex, county and region, 1 January**. Hungarian Central Statistical Office [online]. https://www.ksh.hu/stadat_files/nep/en/nep0034.html [Accessed: 6 Jun 2022].

Jiboye, A. D. (2012). Post-occupancy evaluation of residential satisfaction in Lagos, Nigeria: Feedback for residential improvement, *Frontiers of Architectural Research*, Vol. 1, No. 3, pp. 236-243. https://doi.org/10.1016/j.foar.2012.08.001

Jun, H. J., Jeong, H. (2018). Residential satisfaction among public housing residents living in social-mix housing complexes: The case of the Seoul Metropolitan Area, Korea, *Urban Policy and Research*, Vol. 36, No. 3, pp. 319-335. https://doi.org/10.1080/08111146.2018.1472076

Kaya, N., Weber, M. J. (2003). Cross-cultural differences in the perception of crowding and privacy regulation: American and Turkish students, *Journal of environmental psychology*, Vol. 23, No. 3, pp. 301-309. https://doi.org/10.1016/S0272-4944(02)00087-7

Krūmiņš, J., Sechi, G., Bērziņš, M. (2018). Residential satisfaction and mobility behaviour among the young: insights from the post-Soviet city of Riga. Belgeo, *Revue belge de géographie*, Vol. 3. https://doi.org/10.4000/belgeo.28347

Lu, M. (1999). Determinants of residential satisfaction: Ordered logit vs. regression models. *Growth and change*, Vol. 30, No. 2, pp. 264-287.

Lutz, E. (2020). *The housing crisis as a problem of intergenerational justice: The case of Germany.* A Discussion Paper for the Foundation for the Rights of Future Generations [online]. https://www.intergenerationaljustice.org/wp-content/uploads/2020/07/Discussion-Paper_Lutz_Housing-Crisis.pdf [Accessed: 1 May 2022].

MacFarland, T. W., Yates, J. M. (2016). Kruskal–Wallis H-test for oneway analysis of variance (ANOVA) by ranks. In T. W. MacFarland, J. M. Yates (Eds.) *Introduction to nonparametric statistics for the biological sciences using R*. Cham: Springer, pp. 177-211.

McCray, J. W., Day, S. S. (1977). Housing values, aspirations, and satisfactions as indicators of housing needs, *Home economics research journal*, Vol. 5, No. 4, pp. 244-254. https://doi.org/10.1177/1077727X7700500404

Milić, J., Zhou, J. (2018). Residential satisfaction among young people in post-socialist countries: the case of Serbia, *Journal of Housing and the Built Environment*, Vol. 33, No. 4, pp. 715-730. https://doi.org/10.1007/s10901-017-9579-9

Morris, E. W., Winter, M. (1975). A theory of family housing adjustment, *Journal of Marriage and the Family*, Vol. 37, No. 1, pp. 79-88. https://doi.org/10.2307/351032

Morton, A. (2013). *Housing and intergenerational fairness*. Policy Exchange Report [online]. https://policyexchange.org.uk/wp-content/uploads/2016/09/housing-and-intergenerational-fairness.pdf [Accessed: 1 May 2022].

Mridha, M. (2020). The effect of age, gender and marital status on residential satisfaction, *Local Environment*, Vol. 25, No. 8, pp. 540-558. https://doi.org/10.1080/13549839.2020.1801615

Neisser, U. (1988). Five Kinds of Self-Knowledge, *Philosophical Psychology*, Vol. 1, No. 1, pp. 35–59. https://doi.org/10.1080/09515088808572924

Ogu, V. I. (2002). Urban residential satisfaction and the planning implications in a developing world context: The example of Benin City, Nigeria, *International planning studies*, Vol. 7, No. 1, pp. 37-53. https://doi.org/10.1080/13563470220112599

Oliver, R. L. (1977). Effect of expectation and disconfirmation on postexposure product evaluations: An alternative

interpretation, *Journal of applied psychology*, Vol. 62, No. 4, pp. 480-486. https://doi.org/10.1037/0021-9010.62.4.480

Onibokun, A. G. (1974). Evaluating consumers' satisfaction with housing: an application of a systems approach, *Journal of the American Institute of Planners*, Vol. 40, No. 3, pp. 189-200. https://doi.org/10.1080/01944367408977468

Pagani, A., Baur, I., Binder, C. R. (2021). Tenants' residential mobility in Switzerland: the role of housing functions, *Journal of Housing and the Built Environment*, Vol. 36, No. 4, pp. 1417-1456. https://doi.org/10.1007/s10901-021-09874-5

Razali, N. M., Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests, *Journal of statistical modeling and analytics*, Vol. 2, No. 1, pp. 21-33.

Rojo Perez, F., Fernandez-Mayoralas Fernandez, G., Pozo Rivera, E., Rojo Abuin, M. J. (2001). Ageing in place: Predictors of the residential satisfaction of elderly, *Social Indicators Research*, Vol. 54, No. 2, pp. 173-208. https://doi.org/10.1023/A:1010852607362

Shum, C., Ghosh, A. (2022). Safety or service? Effects of employee prosocial safety-rule-breaking on consumer satisfaction, *International Journal of Hospitality Management*, Vol. 103, No. 103225. https://doi.org/10.1016/j.ijhm.2022.103225

Srivastava, A., Beri, A. (2016). Student satisfaction with service quality in higher education institutions: An analytical review, *Man India*, Vol. 96, No. 5, pp. 1403-1415.

Waziri, A. G., Yusof, N. A., Abd Rahim, N. M. S. (2014). Occupants housing satisfaction: does age really matter?, *Urban, planning and transport research*, Vol. 2, No. 1, pp. 341-353. https://doi.org/10.1080/21650020.2014.935467

Weckroth, M., Ala-Mantila, S., Ballas, D., Ziogas, T., Ikonen, J. (2022). Urbanity, Neighbourhood Characteristics and Perceived Quality of Life (QoL): Analysis of Individual and Contextual Determinants for Perceived QoL in 3300 Postal Code Areas in Finland, *Social Indicators Research*, pp. 1-26. https://doi.org/10.1007/s11205-021-02835-z

Zheng, H. W., Shen, G. Q., Wang, H. (2014). A review of recent studies on sustainable urban renewal, *Habitat International*, Vol. 41, pp. 272-279. https://doi.org/10.1016/j.habitatint.2013.08.006

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GATED COMMUNITIES IN LVIV: BETWEEN SOCIAL DEMAND AND SPATIAL LIMITATION

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The article considers the phenomenon of the positive perception of gated communities in Lviv, with an emphasis on historical aspects of urban planning. The research has shown that under certain conditions, the existence of gated communities is necessary and their popularity is justified. Therefore, it is necessary to develop mechanisms to avoid their negative consequences. In order to understand how closed communities function, and to identify natural trends in the development of this type of facility, their formation in other parts of Europe was analyzed. The results show that this approach is common for the living environment, but that it has its own characteristics at the level of formal expression and functional content. Form and location in the city structure are not essential for the formation of gated communities, with their effective functioning and logical connection with the external environment being more important. There is also a contradiction between the current situation, which is to ensure the physical security of the inhabitants, and the principles of sustainable urban development aimed at the concept of barrier-free space.

***Key words*: city planning, gated communities, Lviv.**

INTRODUCTION

The topic of gated communities has become popular due to the progress of the theory of inclusive urban space. It is especially relevant for urban environments marked by cultural and ethnic diversity, which need positive integration and the neutralization of potential conflicts. Gradually, a consensus has been formed that interprets the spatial isolation of different groups of the population from each other negatively.

The sociological study of gated communities is characterized by a number of different points of view. One of them is the understanding of a gated community as a form of housing, which at the territorial level has signs of isolation and control. There are examples whereby convenience and safety have led to the formation of gated communities as towns, with their own street and public facilities. There are also situations in which a gated community is the industry standard for the real estate market. There is therefore special interest in studying this debatable phenomenon, which on the one hand is a guarantee of security, stability and segregation, and on the other has a negative impact on the development of a city and its inhabitants living outside such communities. The paper begins by determining the place of gated communities in the urban development strategy of Ukraine. The main part of the study describes the functioning and specifics of the closed communities in Lviv in the city planning context.

BASIC THEORY PART

Recently, a large number of documents have been approved on the need to strike a balance between the modern needs of mankind and protecting the interests of future generations. Within the framework of this concept, a strategy for the development of European cities was agreed in 2007 at an informal meeting of ministers for urban development and territorial unity held in Leipzig, Germany. The basic principles in the field of urban development policy were defined, taking into account today's challenges and historical, economic, social and environmental aspects (Buchholz and Weigel, 2021; Weigel, 2021).

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Against the background of complex political transformations in 2015, Ukraine also announced a strategy which declared the goal of implementing European living standards (Ukaz prezydenta Ukraïny *Pro Stratehiiu staloho rozvytku 'Ukraïna – 2020'*). In parallel with the implementation of tasks of national importance, an idea aimed at the development of Ukrainian cities based on the model of European ones was presented. One related project was "Integrated Urban Development in Ukraine", developed specifically for Ukraine jointly by Germany and Switzerland (N'oltinh, 2020). These ideas are currently being promoted and implemented in eight of Ukraine's cities (Lviv, Chernivtsi, Vinnytsia, Zhytomyr, Poltava, Melitopol, Kharkiv and the Podilskyi district of Kyiv). The basis for this concept was the Leipzig Charter for a Sustainable European City and the UN Sustainable Development Agenda until 2030. Finally, Ukraine has recently been actively working on various international projects based on sustainable urban development.

A number of European organizations working to implement the concept of sustainable development are promoting territorial cohesion. For example, the European Commission, working on the development of modern European cities, sees the problem of a lack of territorial cohesion and emphasizes the need for an integrated approach to this type of problem, in order to solve it (Weigel, 2021). Focusing on integrity and systematicity, an approach is proposed in the documents mentioned above that ensures physical accessibility and functional diversity. At the level of the gated communities in a single city, these aspects are also very important, as they are related to the quality of urban space, the formation of social ties, and satisfaction with the living environment within a certain area. With the coordinated functioning of all parts of the material and spatial environment of human life, it is possible to ensure the balanced and harmonious development of a city as a whole.

In Ukraine, the implementation of the principles of the European city at the level of reforming and modernizing the living environment is also noticeable. According to sociologists and city planners, new standards need to be introduced to ensure comfortable and safe living. In this situation, the real estate market is also important, which in conditions of competition tries to please the buyer in various ways and promote, in their opinion, "modern" approaches to the formation of residential complexes. A new urban form called the "gated community" is emerging.

THE CURRENT STATE OF THE GATED COMMUNITY DISCOURSE

The theoretical basis of the study is: work on the sustainable development of cities (Buchholz and Weigel, 2021; Weigel, 2021; N'oltinh, 2020; President of Ukraine, 2015); issues related to the definition of a gated community (Roitman, 2010); the nature of closed communities within a city (Blandy, 2007; Durington, 2011; Lentz, 2004; Low, 2001; Marcuse, 1997); and the specifics and features of their organization at the territorial level (Balčaitė and Krupickaitė, 2018; Ghonimi *et al*., 2011; Grant and Mittelsteadt, 2004; Le Goix, 2003; Mohamed and Ayad, 2018; Webster *et al*., 2002). In Ukraine at the beginning of the 2020s, this topic remains virtually unrepresented among the array of local scientific reflections. The local scientific and expert community has not yet formed its attitude to the phenomenon of gated communities in the city, and there is no research on their impact on the quality of urban space, social ties, subjective satisfaction with the living environment, etc. The appeals to limit the development of gated communities, that are so typical of European urbanist thought, do not have a favorable response in the context of the Ukrainian city.

The methodological foundations of the study are philosophical, ideological and logical-epistemological approaches. Their application is determined by the specificity of the phenomenon of "closedness" and "community" in urban planning and the definition of the features that can describe them. The method of theoretical analysis was used to choose the research topic, define the etymology and essence of the key concept for the study of gated communities, and systematize and generalize the facts about the specifics of the functioning and formation of gated communities in Lviv at the territorial level. The use of the hypothetical-deductive method was based on the need to substantiate the reason for the existence of a gated community and to conclude that the problem of its functioning also occurs in the field of urban planning. Morphological description was used at the initial stage of the research to collect information about the formal properties of the residential formations, such as shape and geometric characteristics. Cluster analysis was used to identify groups of structural elements in the city that were similar in formal features. Before using this analysis, the objects were systematized. Their main characteristics (for example, the composition of the building) and the degree of similarity (or difference) were determined.

The object of consideration is the gated community, which since the end of the 20th and beginning of the 21st century, has acquired clear expressive qualities in the life of society. The spread of such communities has attracted the attention of a wide range of scientists, with discussion among sociologists and city planners about their impact on the life of society and on the functioning of the city. Some emphasize their advantages, while others point out their shortcomings and illegality, due to non-compliance with the requirements for installing enclosing structures within the living environment. This uncertain situation is justified by the need to form a full barrier-free environment for everyday human life, formulated in the State Building Regulations B 2.2-12: 2018 "Planning and development of territories" (Derzhavni Budivel'ni Normy Ukraïny, 2019). The authors of the article do not aim to take anyone's position, but rather try to understand how gated communities are formed at the territorial level and discover what their impact is on the functional and planning development of the city.

Of certain research interest is the difference in the values attached to the definition of closed formations. The concepts of spatial segregation and gated communities began to be studied in relation to different conditions and cities in Latin America (Sabatini, 2006; Peters and Skop, 2007), Asia (Firman, 2004), Africa (Nesma, 2018) and Europe (Rokem and Vaughan, 2018), including Eastern Europe (Balčaitė and Krupickaitė, 2018; Chabanyuk *et al*., 2021; Polanska, 2010). This topic has also caused some interest also in Ukraine

(Prepotenska and Tymashova, 2016).

Roitman (2010, p. 31) emphasizes the problem of conceptualizing the phenomenon of the gated community, as some authors prefer to use definitions such as "gated residential developments" or "condominiums". In the theory and practice of urban planning, this issue will remain open until the nature of how closed communities function and their impact on the functional and planning development of the city become clear.

GATED COMMUNITIES AS A SUBJECT FOR STUDY IN THE CITY PLANNING CONTEXT

A community is an association of people united by common living conditions, goals and interests, which is an important category in sociology, but this is interpreted differently in various concepts of society. The current state of scientific discourse demonstrates the extraordinary diversity of communities, reflecting the historical and other contexts of the countries in which they emerge. In some cases, the community is associated with a specific area, in others – an imagined one. Also, gated communities are the subject of study in various fields of knowledge. For example: the behavioral nature of expression is the subject of attention for psychologists; living in a particular place is of interest to geographers; common property and incentives to meet individual needs are of interest to economists; and all of these influence planning and the resulting functional qualities.

Due to the possibility of access only for a certain, limited number of people, communities can be described as either open or closed. Open communities can be considered capable of establishing social ties, and are unlimited in social, spiritual and physical dimensions. Diametrically different are closed communities, which have restricted access, and in which normally public spaces are privatized (Roitman, 2010, p. 31).

Concepts of the modern European city contradict the way gated communities function. As a result, many scholars are prejudiced against closed communities, recommending they should be avoided and opposed in cases where such communities have already been formed. This is based on stereotypes, the first of which is that such communities are typical of areas with poor living conditions, or areas in which there are social groups whose views do not agree with the majority of the population. The second has relative characteristics, as it is associated with a feeling of physical limitations, namely that if certain boundaries are set, a person experiences a lack of development. And the third has to do with aesthetics: the harmony of the city and its components, and a sense of comfort, coziness and security.

Studying the specifics of functioning, and the features of the formation and development of the urban environment, urban planners recommend avoiding this type of community and emphasize the various problems that may arise. Particular attention is paid to the fear caused by political control and migration management. Therefore, the problem is not just a threat to the comfort of citizens, but rather it also has a political aspect.

In one of the first fundamental works, Gated Communities in the United States by Blakely and Snyder, on American closed communities, it was noted that since the 1970s, isolated neighborhoods have developed significantly, becoming a symbol of the fragmentation of cities and growth of social segregation (Le Goix, 2003).

Research conducted on this topic in Lviv (Ukraine) has shown that under certain conditions, the existence of gated communities is sometimes necessary, and their popularity among the population is justified. According to ordinary citizens, they can provide comfortable living and improve the quality of life in the city. Therefore, at some point the developer responds to customer requests and installs a fence to increase the cost of sales, or residents do it themselves, when initially there is no such fence. In such a situation, it is necessary to develop other original mechanisms to avoid the negative consequences of the existence of gated communities. At the same time, their development should be preceded by a thorough study of the formation peculiarities of closed communities in the structure of the city at the territorial level, which is the purpose of this article.

FEATURES OF THE FUNCTIONING AND FORMATION OF LVIV'S GATED COMMUNITIES

In the context of the problem of forming an inclusive living environment, the countries that were once members of the so-called "socialist camp" have a special place. This is due to the legacy of the egalitarian housing estates of the 1960s and 1980s, built on standard designs. Although they have traditionally been criticized for monotony and pragmatism, they have been characterized by the principles of inclusiveness, which precluded spatial separation on the basis of property or status. Historical centers in the Soviet era also underwent egalitarian transformation. Large multi-room apartments were redesigned so that several smaller ones appeared in their place.

By the end of the twentieth century, Lviv already looked like a city where spatial segregation on a social basis was significantly leveled (Senkiv, 2021). For example, the Sykhiv residential district in Lviv was founded in the 1970s. It developed in accordance with the clearly defined norms and principles of the time, which were formulated in response to the then problems associated with the development of industry. As a result, spacious, green residential yards were created on the territory of the new residential area as the main places of recreation for the population, as well as pedestrian alleys and boulevards, which connected all elements of the neighborhoods (Cherkes, 2015). This connection united groups of separately located and grouped houses into one whole. This approach to the formation of new residential areas was typical in Lviv and other cities that were growing in Soviet times. In these circumstances, it should not be surprising that the problem of gated communities and spatial segregation has long been completely absent among the urban planning issues of Lviv, as well as many other similar cities.

Today Lviv is a city with a long history that is known for its many architectural monuments. It attracts the attention of many people because of its compact shape and geographical proximity to the European Union. This strengthens internal

migration processes and contributes to the rapid growth of housing construction. The Main Office of Statistics for the Lviv region has been recording an increase in the volume of housing construction for seven years (since 2015) (Main Statistical Office in Lviv Region).

Along with the increase in construction, various forms of organization of the living environment are developing. In particular, there is a tendency to fence off an area, even before the commissioning of a facility. In this way, the inhabitants of residential buildings and the surrounding area begin to exist according to the rules of the so-called gated community.

Here appears a problem that, at first glance, has a social and economic nature. However, in-depth analysis makes it clear that the problem exists at a territorial level. Since the problems of the formation of the material and spatial environment of the city are touched upon, it is time to involve the competence of urban planners.

During 2021, some work was carried out to determine the zones with the greatest distribution of closed communities in Lviv. These were the territories of new buildings with a high density of housing and public buildings, as well as those that are within or in close proximity to the historic center of the city (Figure 1).

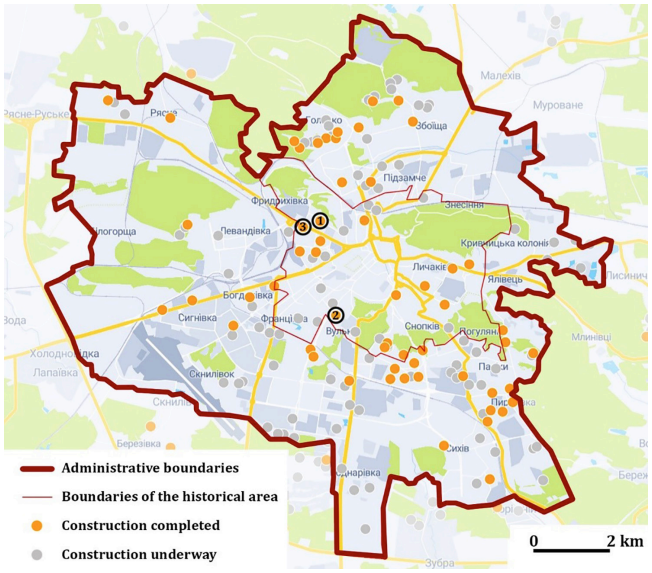

Figure 1. Area of distribution of new buildings in Lviv; the central district is the historical area of the city: 1 – Zolota, 10; 2 – Karpinets, 8; 3 – Shevchenko, 80
(Source: Summarized by Yuliya Idak based on the online catalog of new buildings in Ukraine LUN, 2022 (Kataloh novobudov v Ukraïni LUN))

The identification of gated communities on the territory of Lviv was carried out based on the presence of vertical fencing structures of the open type, built around one or several multi-apartment residential buildings, which have the character of a new residential district or quarter.

The ideal model of a closed community at the territorial level can be represented as a fragment of the city bounded by objects that create logical boundaries in the form of a polygon. It contains buildings and a free area for the implementation of communication and recreation functions. The most common components include approaches, transport entrances, car parks and a playground.

The ideality of the model is related to interdependent categories: *privacy → closedness → security.* Privacy is seen as a state in which a group of building occupants establish control over the functioning of an adjacent area and protect it from unwanted access, thus providing physical isolation. Gatedness occurs due to autonomous enclosing structures of a closed or open type. The main criterion for organizing the living environment is safety, which is expressed as guaranteed protection from outsiders. Finally, in the process of popularizing housing, along with detailed technological characteristics of the building, there are data on the infrastructure of the territory, which is reduced to information about the gated area and the presence of a children's playground (and, in some cases, sports area).

In quantitative terms, the Lviv gated communities are not yet a noticeable phenomenon. At the same time, their number is constantly growing. They are organized both in already functioning housing units and those that are just being designed. The characteristics of new construction projects are widely available, emphasizing that in the future the territory will be "closed to cars and outsiders".

The gated communities which emerged in Lviv at the beginning of the 21st century initially simply looked like isolated buildings which were designed according to the stereotypes of modernist urban planning, in accordance with the principle of convenience and spaciousness (for example, Zolota, 10; Karpintsia, 8). Later, some gated groups appeared. Depending on the relationship with the residential building, they began to reflect centric (characteristic of closed communities functioning in the so-called internal space of the building), one-sided (on one side of the building) and multi-sided (simultaneously from several sides or around the building) schemes (Figure 2 a, b).

Studies of a number of closed communities have shown that as of 2021, Lviv has developed an exceptionally positive attitude towards the isolation of the environment. The main factor noted by residents is security. Homeless people, drug addicts and criminals are most often among the neighborhood dangers that can be avoided by isolation. It should be noted that the separation of space for security reasons occurs both at the design stage and as the initiative of existing residents from open residential complexes. The feeling of insecurity from crime and drug trafficking networks completely eliminates the arguments against gated communities, such as greater solidarity with the surrounding residents, avoidance of social tensions, and so on. In one cases, residents' self-isolation, the final argument in favor of segregation, was the murder of a gardener by a group of criminals who entered a residential complex located in a socially problematic area near the train station.

In addition to this main safety criterion, the isolation of the adjacent space is positively perceived for reasons of child care. Residents note the convenience of fencing, which makes it possible to leave children for some time without direct adult supervision. Over time, a certain team of children and parents is formed, which gradually unites, and additionally contributes to the safety of children and the convenience of those who care for them.

Figure 2. The main types and examples of the organization of gated communities in Lviv: a – one-sided, Zolota, 10; b – versatile, Karpinets, 8; c – unilateral, Shevchenko, 80
(Source: Roman Frankiv, 2022)

Gated communities become a place for the formation of more sophisticated neighborhood solidarity groups. Together they solve the problems of landscaping, their way of life, and entertainment. There is a kind of family microclimate, which helps to overcome feelings of loneliness and alienation from neighbors, which are characteristic of traditional residential buildings. In this sense, we can say that closed communities play a positive role and solve the problem of socialization of the resident in the urban space, which in this case is narrowed to a scale capable of forming a cohesive community.

The next factor that can be related to the post-Soviet specifics of Lviv society is the emergence of a sense of "privacy" within a closed community. In the communist era, public space was perceived as "state" and began at the door of the apartment. The feeling of personal involvement in such a state environment was quite low. The space of the gated community became the place where the feeling of personal involvement in the living environment outside the apartments of the residents returned.

Another argument in favor of gated communities in Lviv, which is post-Soviet in nature, is a reference to historical analogues. In the days of the collapse of the communist system, the "progressive" model of the worldview was revised. Positive patterns of life began to be taken from the pre-modern past, which have undergone significant idealization. The fencing of courtyards and adjacent territories has become associated with a return to a more "correct" organization of life in historical urban neighborhoods with closed atriums.

Although, as research has shown, the isolation of courtyards in Lviv is perceived positively, it is worth noting some of their problematic aspects. In the context of social interaction, in some cases, we can note the deterioration of attitudes towards the residents in gated communities among the surrounding residents of traditional open houses. There are two factors for consideration. The first is the emergence of differences in the ability to move through urban space. Residents of gated communities have more freedom of choice than residents of open space areas, who are restricted from accessing gated areas. This is especially noticeable in the area within the radius of pedestrian accessibility. Residents of open spaces become restricted in movement, while residents of closed spaces do not. Thus, the second negative factor in the growth of gated communities in Lviv is the complication of spatial communication. The growth of gated communities leads to the withdrawal of large areas from public access, which is especially felt in those buildings that are designed on the principles of modernist urbanism. According to the principles of the Athens Charter, the urban fabric is formed by separately located multi-storey buildings surrounded by landscaping and communications. In Lviv,

there are cases in which the area around such buildings is fenced off, which limits and complicates the movement of other residents, and blocks their access to the shortest pedestrian routes (Karpintsa, 8) and recreational and landscape areas (Zolota, 10) (Figure 2 a, b).

It is also worth noting that despite the traits of solidarity and cohesion within closed communities, these traits are degrading on a large scale. The participants of various isolated courtyards, both gated and not gated, are alienated from each other. The communicative cluster of pedestrian accessibility, the importance of which has increased in modern urban planning (Moreno *et al*., 2021), is fragmented and is losing its potential.

Preliminary observations have shown that there are fewer and fewer places where residents in areas with closed communities can meet and interact in some way. In Lviv, these places are shops and churches. Kindergartens and schools are no longer places of universal communication, as more affluent residents of gated communities choose paid institutions with higher levels of service for their children, ignoring existing communal institutions in their place of residence. The same can be said of the health care system. The rise of home delivery services and the decline of post-Soviet religious enthusiasm threaten to eliminate these last two venues for residents within the same residential area.

In view of the above, it can be argued that in the post-Soviet context, in particular in Lviv, gated communities have a favorable public perception and play a positive role in the evolution of the urban community. Negative factors that have led to criticism of gated communities in European urban planning, in particular social segregation and growing conflict, are largely offset by the great egalitarian legacy of the Soviet period and the relative ethnic and cultural homogeneity of society. In major European cities, spatial segregation occurs in large numbers of immigrant communities and identities. As a result, there is a growing threat of isolation of certain ethnic and religious groups in their closed environment, which may lead to increased alienation and conflict. In Lviv, where immigrant communities are very insignificant, there is no such danger. Instead, there is growth in tensions between various rich and poor segments of the population, a growth of hostility and alienation, which are exacerbated by the spread of such concepts as “elite area”, “elite house” and so on. A common condition of being “elite” is closedness and isolation from the “others”.

Lviv has a difficult security situation and a significant number of homeless people. Therefore, closed housing communities are an element of the commercial positioning of real estate in the market. On official websites of developers (Kataloh novobudov v Ukraïni - LUN, 2022), information about the “closedness” of the territory is mandatory.

These facts show that the concept of criticism of closed communities, characteristic of European urban planning, cannot be mechanically transferred to post-Soviet soil, in particular in Lviv. Probably, a promising way to avoid the negative consequences of spatial separation may be new public spaces, which will replace (or supplement) shopping malls and religious buildings.

CONCLUSION

The specifics of the phenomenon of spatial segregation in Lviv have been outlined, as well as the peculiarities of its perception by residents and predominant social groups. The low initial level of socio-spatial segregation associated with the legacy of egalitarian Soviet urban planning has been identified. A number of factors have been revealed that contribute to the positive perception of gated communities, among which the main ones are security, a sense of privacy, convenience of child care and solidarity of the neighborhood’s team.

The study of the peculiarities of gated communities in Lviv on the territory of newly built housing showed that at the city level they function like a territorial object with clear features and characteristics:

- *a fixed boundary*, fixed by various types of fences in order to physically separate from the public area. Depending on its size and the status of the community, one or more entrance doors and gates are installed in the fence structure. It is one of the key features of closed communities;
- *a typical functional* organization, which is based on the observance of the clarity of the residential, recreational and economic zone and their rational placement. Depending on the size of the territory and the status of the community, their number and size differ significantly;
- *with a connecting element*, which, depending on the size of the territory and the status of the community, is denoted by a street or a small area. They act as transits between different functional areas and are directly related to the entrance to the community; and
- *the necessary set of infrastructure components* for the proper functioning of the living environment. Such objects can be recreational centers for different age groups, facilities for physical culture and health purposes, various forms of institutions for children of preschool and primary school age, etc. Depending on the size of the territory and the status of the community, their presence and variety differ significantly.

It has been revealed that in addition to the prevailing positive perception of gated communities in Lviv, there are also negative consequences. These include difficulties in spatial communication, blocking access to landscape and recreational areas, and a possible increase in alienation and hostility between the residents of closed and open communities.

As a result of this analysis, it was found that such post-Soviet cities as Lviv have their own specifics, for which European principles of avoiding spatial segregation cannot be applied by the method of mechanical inheritance. The outlined set of features should be the subject of a separate scientific analysis and a separate set of interpretations of gated communities, given their positive perception by society, and advantages in areas with a low level of security and a large number of problematic social groups.

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REFERENCES

Balčaitė, S., Krupickaitė, D. (2018). Perspectives of gated communities' socio-spatial integration: the case of post-socialist Lithuania, *Belgeo*, No. 4. https://doi.org/10.4000/belgeo.23832

Blandy, S. (2007). Gated communities in England as a response to crime and disorder: context, effectiveness and implications, *People, Place and Policy Online*, Vol. 1, No. 2, pp. 47–54. https://doi:10.3351/ppp.0001.0002.0001

Buchholz, T., Weigel, O. (2021). *Die Neue Leipzig-Charta und ihr Umsetzungsdokument: Vom politischen Dokument in die Praxis der Stadtentwicklung*. EUROPA kommunal 1: Städtische und Ländliche Entwicklung [online]. pp. 3-7. https://www.rgre.de/fileadmin/user_upload/pdf/publikationen/ek_artikel_19-22/ek1-2021_Beitrag.pdf [Accessed: 20 Oct 2022]

Chabanyuk, O., Shvets, I., Abramiuk, I. (2021). Metodolohichni problemy post-sot͡sialistychnykh transforma t͡siy z͡hytlovoho seredovyshcha v Ukraïni ta skhidno-͡ievropeĭs'kykh kraïnakh (in Ukrainian), *Naukovyĭ visnyk budivnyt͡stva*, Vol. 103, No. 1, pp. 93-98. https://doi.org:10.29295/2311-7257-2021-103-1-93-98

Cherkes, B. S. (2015). Development of the largest residential district of Lviv – Sykhiv, *Architectural Studies*, Vol. 1, No. 1, pp. 54-61. https://doi.org/10.23939/as

Derz͡havni Budivel'ni Normy Ukraïny (2019). Kyïv: Minrehion Ukraïny (in Ukrainian) [online]. https://dbn.co.ua/ [Accessed: 20 Oct 2022].

Durington, M. (2011). Gated Communities: Perspectives on Privatized Spaces: Review Essay, *International Journal of Urban and Regional Research,* Vol. 35, No. 1, pp. 207–211. https://doi.org/10.1111/j.1468-2427.2010.01033_1.x

Firman, T. (2004). New town development in Jakarta Metropolitan Region: a perspective of spatial segregation, *Habitat International*, Vol. 28, No. 3, pp. 349–368. https://doi:10.1016/s0197-3975(03)00037-7

Ghonimi, I., Alzamly, H., Khairy, M., Soilman, M. (2011). Against the great divide between theory and practice: gated communities versus urban liveability. In S. Manfred, P. Vasily V., E. Dirk and E. Pietro (Eds.), *REAL CORP 2010: Liveable, prosper, healthy cities for everyone* [online]. https://www.academia.edu/1025396/Against_the_Great_Divide_Between_Theory_and_Practice_Gated_Communities_Versus_Urban_Livability [Accessed: 24 Oct 2021].

Grant, J., Mittelsteadt, L. (2004). Types of gated communities, *Environment and Planning B: Planning and Design,* Vol. 31, No. 6, pp. 913-930. https://doi.org/10.1068/b3165

Kataloh novobudov v Ukraïni (LUN) (2022). Novobudovy L'vova ta oblasti na karti, vsi z͡hytlovi kompleksy (Z͡HK) (in Ukranian) [online]. https://lun.ua/uk/нерухомість-львова-на-карті?radius=140&construction_state=built#10.38/49.8486/24.0377 [Accessed: 30 Jan 2022].

Le Goix, R. (2003). *Fulbright Scholar Examines Gated Communities in Southern California.* UCLA Global. UCLA International Institute [online]. https://international.ucla.edu/institute/article/4664 [Accessed: 30 Jan 2022].

Lentz, S. (2004). More gates less community? Guarded housing in Russia. In J. Glasze, C. Webster, K. Frantz (Eds.), *Private Cities: Global and Local Perspectives.* New York: Routledge, pp. 201-224.

Low, S. M. (2001). The Edge and the Center: Gated Communities and the Discourse of Urban Fear, *American Anthropologist*, Vol. 103, No. 1, pp. 45–58. https://doi:10.1525/aa.2001.103.1.45

State Statistics Service of Ukraine - Main Statistical Office in Lviv Region (2022). *Percentage increase (decrease) in construction production volumes* [online]. http://www.lv.ukrstat.gov.ua/eng/themes/05/th_05e.php [Accessed: 19 Oct 2022].

Marcuse, P. (1997). The Ghetto of Exclusion and the Fortified Enclave, *American Behavioral Scientist,* Vol. 41, No. 3, pp. 311–326. https://doi.org/10.1177/0002764297041003004

Mohamed S., N., Ayad, H. M. (2018). Why people choose gated communities: A case study of Alexandria metropolitan area, *Alexandria Engineering Journal,* Vol. 57, No. 4, pp. 2743–2753. https://doi.org/10.1016/j.aej.2017.10.008

Moreno, C., Allam, Z., Chabaud, D., Gall, C., Pratlong, F. (2021). Introducing the '15-Minute City': Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities, *Smart Cities,* Vol. 4, No. 1, pp. 93–111. https://doi.org/10.3390/smartcities4010006

N'oltinh, I. (2020). *Syl'ni mista – syl'na Ukraïna* (In Ukranian). Kyïv: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. https://www.giz.de/en/downloads/giz2020-uk-starke-staedte-starke-ukraine.pdf [Accessed: 19 Oct 2022].

Oxford University Press (2020) *Community (noun).* Oxford Learner's Dictionaries [online] https://www.oxfordlearnersdictionaries.com/definition/english/community?q=community. [Accessed: 24 Oct 2021].

Peters, P. A., Skop, E. H. (2007). Socio-spatial Segregation in Metropolitan Lima, Peru, *Journal of Latin American Geography,* Vol. 6, No. 1, pp. 149–171. https://doi:10.1353/lag.2007.0009

Polanska, D. V. (2010). Gated Communities and the Construction of Social Class Markers in Postsocialist Societies: The Case of Poland, *Space and Culture,* Vol. 13, No. 4, pp. 421–435.

Prepotenska, M., Timashova, O. (2016) Filosofi͡a mista: bidnist' i bahatstvo v konteksti sehreha t͡siï prostoru (in Ukrainian). *VISNYK NTUU "KPI". Filosofii͡a. Psykholoii͡a. Pedahohika,* Vol. 3, No. 48, pp. 63-70.

President of Ukraine (2015) *Ukaz prezydenta Ukraïny - Pro Stratehii͡u staloho rozvytku 'Ukraïna – 2020'.* Kyïv: Verkhovna Rada of Ukraine [online]. https://zakon.rada.gov.ua/laws/show/en/5/2015?lang=en#Text [Accessed: 20 Oct 2022].

Roitman, S. (2010). Gated communities: definitions, causes and consequences, *Proceedings of the Institution of Civil Engineers – Urban Design and Planning,* No. 163, pp. 31–38. https://doi:10.1680/udap.2010.163.1.31

Rokem, J., Vaughan, L. (2018). Geographies of ethnic segregation in Stockholm: The role of mobility and co-presence in shaping the 'diverse' city, *Urban Studies,* Vol. 56, No. 12, pp. 2426–2446. https://doi:10.1177/0042098018795561

Sabatini, F. (2006). *The Social Spatial Segregation in the Cities of Latin America.* Inter-American Development Bank [online]. https://www.researchgate.net/publication/254421281_The_Social_Spatial_Segregation_in_the_Cities_of_Latin_America [Accessed: 19 Oct 2022].

Senkiv, Z. (2021). Evaluation of the phenomenon of spatial segregation in Lviv: Historical aspect, *Bulletin of Lviv Polytechnic National University - Series of Architecture,* Vol. 3,

No. 2, pp. 79–83. https://doi.org/10.23939/sa2021.02.079

Webster, C., Glasze, G., Frantz, K. (2002). The Global Spread of Gated Communities, *Environment and Planning B: Planning and Design,* Vol. 29, No. 3, pp. 315–320. https://doi.org/10.1068/b12926

Weigel, O. (2021). *Die Neue Leipzig-Charta – Von der Strategie zur Umsetzung*. Stadtentwicklung [online]. https://www.vhw.de/fileadmin/user_upload/08_publikationen/verbandszeitschrift/FWS/2021/2_2021/FWS_2_21_Weigel.pdf [Accessed: 19 Oct 2022]

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CONCEPTUALIZATION OF CLIENT 'NEEDS' IN ARCHITECTURAL THEORY AND PRACTICE

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The article aims to discuss the ambiguity of the need concept in architecture, and reasons for the existence of several strategies for dealing with need as an ontological and epistemological basis for architectural design. The paper systematizes the conceptualizations of need in architecture, provides a comparative analysis of its various interpretations and explains the differences between ideological, philosophical and theoretical viewpoints. A variety of meanings are analyzed using the author's concept of "paradigms of socio-architectural knowledge". Five platforms of social knowledge can be distinguished in architectural theory, each of which relies on its own understanding of human beings and sees the content of human existence in its own way. Considered through the prism of the paradigms, different visions of the concept of need find their logical and methodological explanation. Each paradigm gives its own answer to who or what is the bearer and exponent of the need, and procedures for identifying needs in design. The paper presents "stairs of needs" as a metaphor, ordering the range of possible actions of the architect in relation to the needs of the client – from obstruction and conscious deformation to satisfaction and phenomenological embodiment.

Key words: **the concept of need, architectural theory, terminological analysis.**

INTRODUCTION

A lot of time has passed since postmodernism questioned the social causality of architecture, architectural practice and architectural products. However, the evidence that the belief in the autonomy of architecture in relation to society and the customer does not penetrate deeply into the profession is reproduced again and again. In particular, this refers to the constantly updated discourse about the needs of the client and society as the foundations of architecture (Zinchenko, 1981; Erskine, 1984; Groat, 2000; Popov, 2002; Kiyanenko, 2003; Sirowy, 2010; Salama, 2019; Alfirević and Simonović Alfirević, 2020).

There are three reasons for the author's interest in the topic of need as a subject of theoretical understanding in architecture. First, it is owing to the continuing fundamental role of this category for architectural knowledge and design practice. Secondly, architects' ideas about what a need is, and how it can be defined and interpreted in architectural solutions are extremely complex. Finally, interest in this topic stems from the desire to contrast something with the propensity of many architects to either resort to the most simplistic, positivist versions of need (as something realized by the client, and observable by a researcher), or categorically reject it as the basis of architecture. The former is exemplified by architects who readily use "I want" and "I don't want" in quantitative sociological surveys as the basis for design solutions. The latter can be seen in design strategies of 'starachitects', who do not want be 'waiters'.

Since the beginning of the twentieth century, the thesis about the satisfaction of human needs in architecture has acquired the status of a self-evident truth. Both the concept of need and the thesis of 'meeting the need' as something that architects do became an essential part of architectural knowledge in the era of industrialization in the 1950s. Since then, architects have been turning to these notions in technically and conceptually oriented research (Salama, 2019, pp. 10-11). The postmodern doubt as to the very existence of the social foundations of architecture did not shake the position of this concept too much, except at a purely theoretical level. The belief in the key role of need in architecture still persists in the academy and the profession. Traces of this can be found everywhere – from the publication of research findings to practical design manuals and methods of pre-design architectural programming or post-occupancy evaluation, and to the fundamental documents of international and national architectural organizations. Here

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is some evidence of that.

In the profession: The very definition of an 'architect' given by the *International Union of Architects* sounds like an individual dealing with the "built environment to meet the needs of society" (UIA Accord, 2017, p. 6). The UNESCO-UIA *Charter for Architecture Education* treats the practice of architecture as a field that "gives physical form *to the needs of society* and the individual" (UNESCO-UIA Charter, 2017, p. 6). The *Architects Registration Board* of the United Kingdom articulates the ability to "develop a conceptual and critical approach to architectural design that integrates /…/ the aesthetic aspects of a building /…/ and *the needs of the user*" as one of the basic qualification requirements for an architect (Prescription of Qualification, 2010, p. 4). The US postgraduate internship program *AXP*, in preparation for the professional licensing exam in architecture, includes "programming and analysis". Its content emphasizes: "In this experience area, you'll complete tasks related to researching and evaluating *client requirements*, building code and zoning regulations, and site data to develop recommendations on the feasibility of a project" (NCARB, 2020, p. 6).

In the academy: A brief selective review of publications in the *Archnet-IJAR* journal covering approximately two years (2020-2022) shows that it is rare that a paper completely ignores the topic of people's satisfaction with the results of an architect's work. In every second issue of the journal published during this time, papers appear in which this content is the main one. They consider the satisfaction of the population in welfare housing facilities, healthcare facilities, k-8 public schools and kindergartens, and public spaces. The environmental needs of single mothers, children with autism, and various ethnic and cultural groups of the urban population are also scrutinized in detail (Cho, 2020; Salaheldin *et al*., 2021; Vuković *et al*., 2021; Sheykhmaleki *et al*., 2021; Beheiry and Gabr, 2022; Patel *et al*., 2022; Eloy and Vermaas, 2022).

Thus, both mass professional practice and practically oriented pre-design research still rely on the needs of the client as a legitimate foundation for architectural solutions. Meanwhile, as this study shows, both the concept of need and the strategies for operating with needs in architecture are ambiguous, contradictory and insufficiently explained. In the recent theory of architecture, attempts to promote an understanding of the concept of need are quite rare. One such attempt is a comparative study of the concepts of 'use value', 'human needs' and 'quality of living space' (Alfirević and Simonović Alfirević, 2020).

METHODOLOGY

The research began as a formulation of the main topics addressing the concept of need and continued as systematization of the answers that the theory of architecture gives to them. The basic research questions that predetermine the content of the work are as follows:

- What is the concept of need in relation to the essence of architectural work?;
- Who or what is the bearer and exponent of architecturally significant needs?; and
- What are the architects' strategies regarding needs? Are they always aimed at 'satisfaction', or 'meeting' the needs?

All the observations and conclusions of the paper stem from a comparative conceptual and terminological analysis of English and Russian-language texts on the social aspects of the theory of architecture. At intervals, the author also turns to sources in sociology to clarify some differences in the understanding of the concepts under consideration.

The methodological basis of the research is the author's concept of the "paradigm of social knowledge in architecture". As shown in the author's doctoral research, all the diversity of architects' social vision and the models of social phenomena they use can be reduced to several basic platforms, each of which is based on its own interpretation of a human being and has the content of human life as the core of the paradigm (Kiyanenko, 2005; Kiyanenko, 2018). Each paradigm has its own language for describing life, its own research tools and design methods, and it serves its specific niche of professional practice (Figure 1). Figure 1 shows examples of notions which illustrate the lexicon of individual paradigms as a semantic context for different understandings, research and design applications for needs.

CONCEPT OF NEED IN ARCHITECTURE

What is need?

Each of the social-architectural paradigms is a specific conceptual context, shaping its own understanding of need.

The paradigm of *socio-architectural functionalism* reduces an individual's life to a list of his actions – functions. Understood in this way, 'functions' are associated with human needs. The key ideologists of architectural modernism have repeatedly confirmed this understanding. Such is the statement of Le Corbusier: "To carefully study the human scale and human functions means to determine the needs of a person" (Glazychev, 1986, p. 321). He also said: "All people have the same organisms, the same functions. All people have the same needs" (Le Corbusier, 1927, p. 126). Identification of human needs with life activity can also be found in Russian sources, for example: "A person manifests his needs for housing through a set of specific processes that he performs – forms of homework, personal, family and group communication, intellectual activity and creativity" (Rubanenko and Kartashova, 1981, p. 30).

Another paradigm, *socio-architectural interactionism*, interprets life as social interaction, and it shifts attention from the content of activity to its interpersonal matrices. It also considers the mismatch between interaction structures and spatial structures to be the main problem, as well as evidence that a need exists for architecture to meet. The architect's work with these needs is in creating arenas for interaction and barriers for isolation. Brolin and Zeisel (1972) demonstrated this attitude when they claimed: "The field observer, by asking: "Who is doing what, including or excluding whom?" will most likely encompass all of the necessary sociological components in his observations" (Brolin and Zeisel, 1972, p. 371). As Lerup (1977) noted, "the concepts of social and personal are the most important theoretical device for structuring a home" (Lerup, 1977, p.

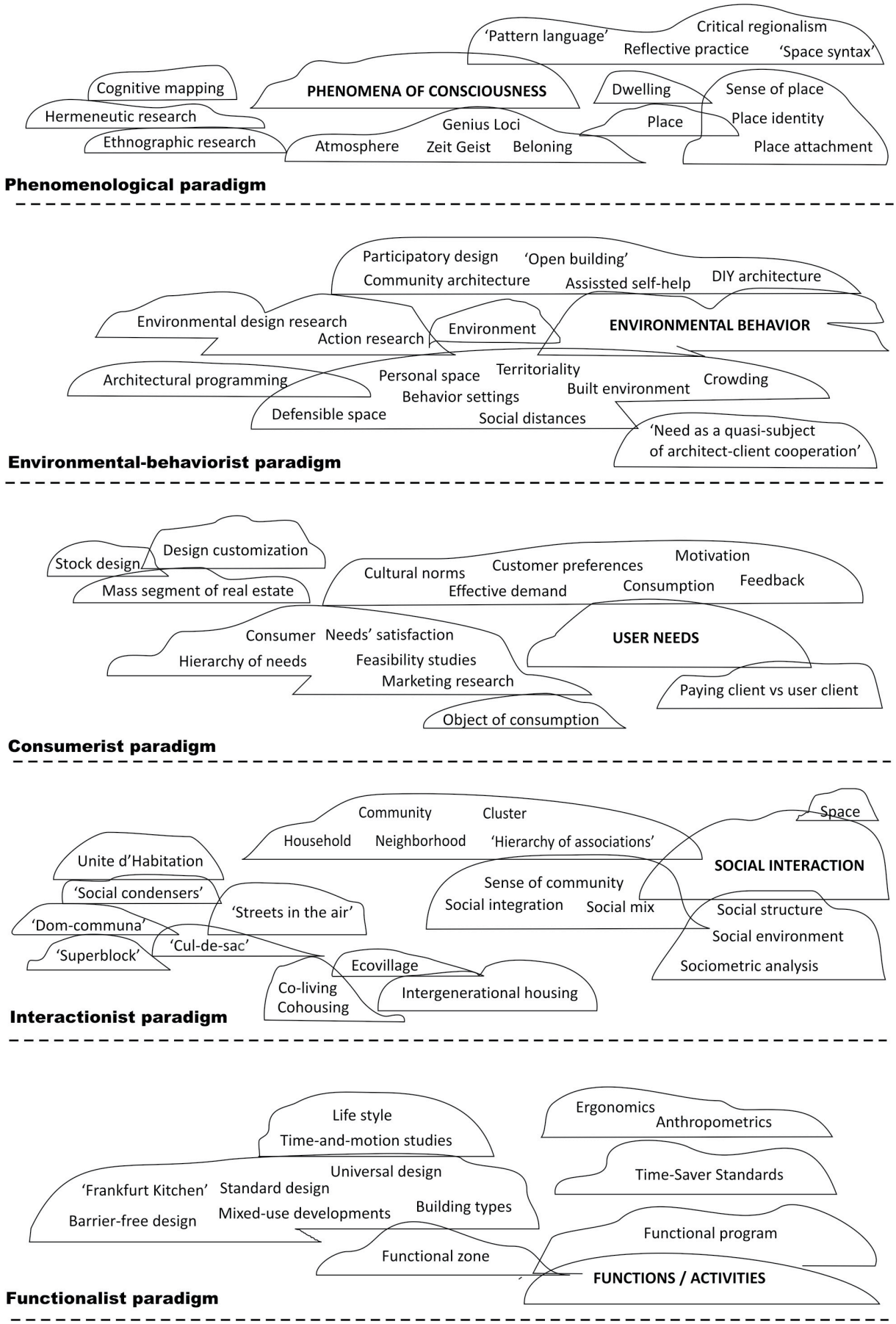

Figure 1. Lexicon of individual paradigms of socio-architectural knowledge
(Source: Konstantin Kiyanenko)

27). Kroll (1984) expressed an interactionist attitude even more globally: "Relationships between people in space that suits them, that is architecture" (Kroll, 1984, p. 167).

The most detailed elaboration of the concept of need belongs to the field of knowledge that we call *socio-architectural consumerism*. There are several versions of the interpretation of need circulating here.

The concept of *need as a preference or a desire* forces the architect to look for an answer to the question of how the desire expressed by a person correlates with those internal, unconscious forms of needs that supposedly exist, in other words, how fundamental preferences are for their use as a guideline in architectural design. The answer, shared by many, is that a preference is not an absolutely arbitrary form of expression of need – it is based on cultural norms as a fairly stable manifestation of social consciousness. Ikonnikov (1990), a Russian architectural theorist, believed that sociocultural norms are "a force that makes him (the consumer) act in a certain way" (Ikonnikov, 1990, p. 214).

The concept that considers *need as synonymous with cultural norms* came to architecture from the sociology of housing: "Consumer needs can be defined in terms of cultural norms applied to judge various aspects of lifestyle or level of living" (Morris and Winter, 1978, p. 153). In the meantime, *preferences* are considered to be family norms that are lowered relative to social cultural norms "due to excusing circumstances". Cultural norms are stable and even conservative; they are created and reproduced in the process of socialization. Preferences are more mobile and reflect the difference between the cultural norm and the actual degree of its possible implementation (*ibid*., p. 40).

For some architectural practice, clients' needs take the shape of an *effective demand*. Its contents are still determined by the cultural norm, but its volume depends on the client's ability to pay. Insufficient solvency for the full implementation of the cultural norm actualizes the 'preference' as a surrogate of the need. The economic concept of demand is supplemented in architectural design by the ideological concept of the spatial social standard, related to the part of society that does not have an acceptable level of paying capacity to apply to the free market. For this second part, the very existence of a need is manifested by the difference between the status quo of living and a fixed social standard for spatial provision.

The *environmental-behaviorist* paradigm of socio-architectural knowledge treats the main content of life as human behavior, i.e., human reactions to the impact of the social, cultural and physical environments. Architect and theorist Zinchenko (1981) formulated the environment-behavior vision of need by saying that "The substance of need appears as a quasi-object of a real system of cooperative activity, where the consumer and the architect occupy special positions, during the functioning of which /…/, a physical environment is created" (Zinchenko, 1981, p. 62). This definition reflects the idea that the need in architecture does not exist in the client's mind *a priori* in a 'ready-to-use form', but rather it is shaped and formulated by the client in the course of the dialogue with the architect, builder, investor and other members of a 'project team'.

Habraken (1972) drew attention to another feature of the architectural, environmental need, speaking about industrial housing, interest in which is currently on the rise again. "The way in which mass housing approaches man's requirements assumes without question the possibility of translating these requirements into actual solid shapes, into architectural designs", wrote Habraken in 1961, "In fact this is only so in the case of requirements which today rate highly: consumer goods/…/. But there are totally different requirements /…/ in the field of housing; requirements which do not ask for products, but which are themselves productive or creative" (Habraken, 1972, pp. 10-11). That is, the need to participate in the creation of an environmental product is as urgent for a human being as receiving the product itself.

The *architectural-phenomenological paradigm* adds its own colors to the understanding of a person as a consumer, and needs as the basis of design. The phenomenological vision of life and human needs is close to the socio-environmental vision, but not reducible to it. On the one hand, the phenomenological attitude is also skeptical of attempts to discern the needs of a person in an observed activity, or associate them with the desires presented. It recognizes the dependence of the behavior and consciousness of the client on cultural norms, imposed patterns, social control and suppression. On the other hand, unlike the environmental paradigm, the phenomenological paradigm sees the explications of true needs not in behavior, or its physical traces and dialogues with the client, but deeply hidden in consciousness and subconsciousness. From there, true needs can be extracted only as a result of the use of special psychological techniques by trained and educated researchers. Sometimes the architect succeeds in such immersion into the client's mind; let's recall the 'mental maps' of Lynch (1960) or 'conversations of the client on behalf of his house with himself' by Cooper-Marcus (1995).

The model of need as a phenomenon of individual consciousness shifts the emphasis from external social determinants of its formation, such as cultural norms, to the individual characteristics of a person that are the result of both hereditary mechanisms and unique life experience. Particularly important are early childhood years, when the process of socialization is not yet completed, cultural norms are not yet internalized, and perception and evaluation are of an unsubstantiated, direct nature. As a result, according to Norberg-Schulz (1996), individual 'schemata' of perception of the world are getting shaped. "The schemata comprise universal structures which are inter-human as well as locally determined and culturally-conditioned structures" (Norberg-Schulz, 1996, p. 424).

The phenomenological model of need is the result of cracking the shell of the conventions which quickly 'cover' a socialized person, and through which it is difficult to see his or her true, unique nature and expression of will. "The study of human behavior, however painstaking and thorough, can never penetrate the thick skin of conditioning which has formed that behavior and which suppresses a truly personal exercise of the will" (Hertzberger, 1992, p. 158). Architectural phenomenologists are not so pessimistic. The need as a phenomenon of awareness of the existential inconsistency of the experience of living on one hand, with

Table 1. Concepts of need in architecture theory

PARADIGMS OF SOCIO-ARCHITECTURAL KNOWLEDGE	BASIC CONCEPTS OF A HUMAN BEING AS AN ARCHITECT'S CLIENT	CONCEPTS OF NEED AS THE BASIS FOR DESIGN
Functionalist	subject of activity	impossibility or inefficiency of activity, effective functioning; need = function, 'functional program'
Interactionist	subject of social interaction	discrepancy between interaction and spatial structures; need = interaction
Consumerist	consumer	unsatisfied desire, self-conscious preference
		unrealized cultural norm / social ideal
		unmet effective demand
		non-compliance of the *status quo* conditions with the social standard
Environmental-behaviorist	subject of behavior	inconsistency of patterns of behavior and organization of the environment
Phenomenological	dweller of the 'lifeworld'	inconsistency of mental 'schemata' of habitat and place

the reality of living here and now (the concept of *lifeworld*) on the other, can be identified in their opinion, but this requires special techniques and training.

A brief summary of the comparative analysis of the concepts of need existing in different paradigms of socio-architectural knowledge is presented in Table 1.

Who or what is the carrier of needs?

The question of who or what expresses the needs for architectural services, presupposes a seemingly simple answer – the person whose diversified concepts can be seen in Table 1. But in the theory of architecture, this question gives rise to a number of different and partly ambiguous answers (Table 2).

Practicing architects know that the major source of information about need is the client, the customer, the end user of the building him or herself. But many modernist architects denied the client's right to demand whatever it was from the architect. Instead of concrete people, needs were attributed to mental abstractions. During this period, expressions like "the requirements of hygiene and culture of everyday life", "the requirements of demography", "the requirements of ergonomics", "the requirements of the scientific organization of life", etc. became widespread. This in turn reflected the idea that the requirements for architecture are formed by expert knowledge embodied in

Table 2. Carriers of the need in architecture and key collisions of its identification

PARADIGMS OF SOCIO-ARCHITECTURAL KNOWLEDGE	ACTUAL CARRIERS OF THE NEED	PROBLEMS WITH IDENTIFYING NEEDS
Functionalist	abstraction of activity, and its determinants (demography, culture of everyday life, scientific organization of life…)	alienation of the activity from the real subject, giving it an independent status subordinating the subject
Interactionist	an individual, small group, collective and society, and relations between them	the predominance of the strategies of "collective interpretation of individual patterns" as opposed to the "individual interpretation of collective patterns" Hertzberger (1992)
Consumerist	end users, paying clients, other members of 'programming teams'	the gap between a building's user and paying clients, between the architect and the user client in the mass segments of the markets
Environmental-behaviorist	socio-spatial communities – real or 'surrogate'	inability to explore socio-spatial integrity due to the specifics of the project situation (absence of real user-clients)
Phenomenological	"the ideal customer for a real commission" (Pallasmaa, 1996); the "inner self" (Cooper-Marcus, 1995) of the inhabitant, hidden under the "shell" of conventions, habits, phobias (Hertzberger, 1992)…	methodological difficulties in detecting phenomena of consciousness, "schemata" of early childhood experience (Norberg-Schulz, 1996)…

scientific disciplines, and not by a real user who does not have such knowledge.

One of the most paradoxical ideas of functionalism is attributing the role of the carrier of needs to the activity itself. Herzberger (1992) expressed the essence of this incongruity in the following words: "/…/ different activities make different specific demands on the spaces in which they are to take place. This is what we have been told /…/, but even if living and working or eating and sleeping could justifiably be termed activities, that still does not mean that they make specific demand on the space in which they are to take place – it is the people who make specific demands, because they wish to interpret one and the same function in their own specific ways" (Hertzberger, 1992, p. 147).

In the course of the evolution of architectural knowledge and architectural consciousness in the twentieth century, the idea that the end user him or herself can act as a carrier of need did not immediately win the right to life. Both socio-architectural consumerism and interactionism originate from this point of departure. One of the collisions of the interactionist approach is to find out how the needs of an individual, a social group, a collective and society as a whole relate to each other. This issue has both ideological and economic implications. Individual and group needs do not always correspond to social ideals, for example, environmental friendliness, social justice and security. And the recognition of the right to diversity to meet individual needs invariably undermines the foundations of rationalizing design and construction, interest in which increases whenever poverty spreads in society, as is happening today.

The contradiction that exists between unifying social attitudes and diversified individual needs is resolved in different ways. For instance, Brolin and Zeisel (1972) proposed distinguishing between "conscious wants" and "unconscious needs", "latent functions of behavior that are integral to the social stability of a group" (Brolin and Zeisel, 1972, p. 374). This distinction is intended to explain and reconcile the conflict between hidden and unconscious, but consolidating, impulses on the part of society, and a conscious, but disintegrating, variety of individual desires. In Russian theory of architecture, a similar proposal was put forward, which appealed to architects to distinguish between individual, group, family and social components in the structure of personal needs, and also to take into account that their ratio in the consciousness of each individual may be different (Rubanenko, 1981, p. 30).

Herzberger (1984) interprets the problem of correlating social and individual needs in his own way. His point of view is especially relevant in relation to the design of affordable housing: "The starting point for the design of houses is still the conception formed by authorities, investors, sociologists, and architects about what people want. This conception cannot be more than a stereotype to which perhaps everyone seems by and large to conform, but to which no one person completely conforms. It is the collective interpretation by a few of the individual wishes of many" (Hertzberger, 1984, p. 14). According to the same author, the solution to the problem is to move from the dominance of 'social needs' in the form of 'collective interpretation', i.e., the forced unification of a huge real variety of individual needs, to "individual interpretation of collective patterns" (*ibid*., p. 14). This creates conditions for the individual to adapt open, universal social models of habitation and environment.

The theory of architecture sees the main problem of detecting need within the framework of the traditional consumerist paradigm, in breaking the direct connection between the architect and the end user in the alienated design and construction process of the mass market or municipal sector. The architect is in direct contact only with the paying client, who is often unable to comprehend the needs of the user client. Zeisel (2006) writes: "The user client has no choice and no control. This situation presents designers with a problem: no matter how much they negotiate with paying clients, it is difficult to plan for the needs of user clients, who are neither well known, nor readily available to plan with" (Zeisel, 2006, p. 50).

In the environmental-behaviorist paradigm of architectural knowledge, it is not people who represent needs. Rather, socio-spatial unities carry and express them: people inhabiting and developing their environment, the environments symbolizing and enforcing people's relationships. We find examples of such unity in all stable communities – families and households, neighborhoods and urban communities, as well as sustainable age, professional, religious, subcultural and other territorial groups. Since the reaction of people to the social and physical environment is *behavior*, we can say that in the environmental paradigm, need acts on behalf of behavior, just as in functionalism it acts on behalf of activity. Participatory design and environment-behavior studies are becoming the tools that allow the architect to work with behavior as an identifier of needs (Zeisel, 2006, pp. 50-51).

There is one, but significant, obstacle to the high human quality of environmental design: project situations when socio-territorial communities do not exist, and even a specific user client is not known in advance. The theory of architecture suggests, in this case, to refer to the figure of a "surrogate client", that is, to an individual or community that can replace the real end user owing to the similarity of their needs (Cherry, 1999, p. 52). For instance, if a project of a mass segment with no real users is to be certified according to the BREEAM system, then contacting a surrogate client is a prerequisite for certification. As they put it "if the site is a new development and there are no existing community representatives, representatives are sought from surrounding communities or from a similar type or size of development" (BREEAM, 2017, p. 20).

Within the framework of phenomenological tradition, an architect also addresses individuals and communities in search of their needs. But this is not an empirical client of the environmental paradigm, rather it is its intelligible essence, a generalization created by the architect in order to reflect the underlying relationships of the dwellers with the place, and not the transient features lying on the surface. "Supporters of the humanization of architecture are completely mistaken when they demand that buildings be designed for the needs of real people. Let them name at least one great building from the history of architecture that would not have been

built for an idealized person. The first condition for creating a good architecture is modeling the ideal client during the execution of a specific order" (Pallasmaa, 1996, p. 452).

A totally different phenomenological attitude associates authentic needs and values, not with abstract idealizations of a person, but with complex psychotechniques of immersion into the consciousness and sub-consciousness of specific dwellers, using the instruments and means of qualitative sociology, psychology and hermeneutics. A classic example of this kind of immersion is the study by Cooper-Marcus (1995) mentioned above, in which she so deeply delved into the relationship between persons and their houses that needs were revealed which had not been realized by the home owners themselves.

Bofill (1993) demonstrates the phenomenological vision of the role of an architect in identifying a client's needs when he states: "To be an architect means to be able to see and identify the spontaneous behavior and movement of the population through the space organized by a person, and, moreover, to notice the need for changes that they may subconsciously strive for. You need to be able to identify these needs in order to make your own contribution" (Bofill, 1993, p. 4).

The architecture strategies of handling the needs

We have already had to use the phrase 'satisfaction of needs' more than once as a designation of what allegedly happens to needs in architecture, i.e., what the architectural work aims at. It is time to admit that this is a big simplification. The architect's attitudes towards needs are more diversified. In Figure 2 below, the author has made an attempt to systematize and visualize architectural strategies of handling needs into a set of stairs (as opposed to Arnstein's well-known *ladder*, which was the inspiration for the given metaphor), climbing the steps of which means changing strategies (Arnstein, 1969). The intention of this image is to emphasize the movement not only from the bottom up, but also forward, that is, the simultaneous development of the concepts in terms of time and content, in the degree of humanization of ideas about need.

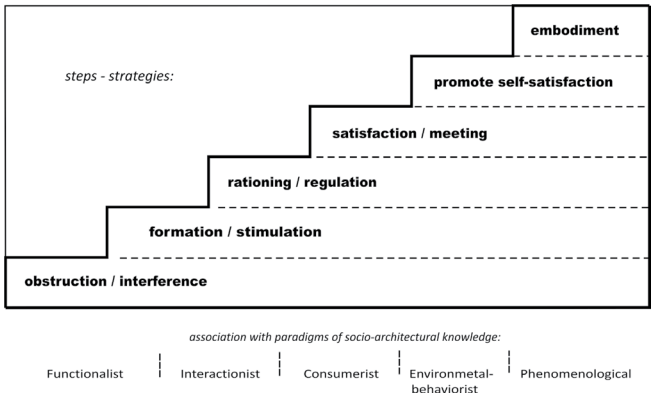

Figure 2. Stairs of dealing with needs in architecture (Source: Konstantin Kiyanenko)

The lower steps symbolize an exotic strategy, but one which is still found in architecture – a conscious opposition of architectural solutions to the intentions and needs of a real client. One of the reasons for obstructing the realization of human needs as they are is ideology. It is known that the Russian architectural avant-garde of the first decades of the twentieth century was inspired by the creation of a new society and a new collectivist personality. This new person was not supposed to have any ethnic, religious, cultural, or family roots. Therefore, the new architecture of a 'commune house' (Dom-Kommuna) and 'socialist city' was aimed at a radical elimination of all the traditional needs of the so-called 'philistines' by means of the collectivization of everyday life. Architecture was at the forefront of the struggle against "family individualism", "possessiveness", "lampshades with brushes" and "bourgeois comfort" for a "strong, cheerful man, a collectivist, public-spirited person" (Kiyanenko, 1991, p. 39). Today, in the 21st century, ecological, religious and ethnic communities can be guided by approximately the same logic.

A violent attitude to the needs of the client can stem from the position of an architect as the artist, a figure of the cultural avant-garde. Eisenman states, for example, which is fully confirmed by his architecture, that his houses "are intended to shake people out of their needs /…/. I am not suggesting people ought to live in my architecture /…/". He goes on to say that "it's enough if my work just makes me and maybe one other person more satisfied" (Groat, 2000, p. 47). Shinohara (1968), a Japanese architect, responded to the critics of the residential buildings he designed in this way: "I sometimes hear the criticism that my houses are difficult to live in. As long as my houses have the kind of "human space" I have in mind, I would like to be able to work as far away as possible from the words "easy to live in" (Shinohara, 1968, p. 42).

Hindering or interfering with needs is a strategy close to creating some new needs – the *second step* of the stairs. The architect, as a social reformer, life builder, radical critic and transformer of society, believes, according to Eco, "that [he] can incline people to a completely new way of life and therefore creates new meanings in the environment, forms, spatial relations and functions" (Stepanov *et al*., 1993, p. 151). In the era of early, romantic modernism, a new type of professional architect was formed, which "changed the modus operandi of the architect … to a new type of professional, who was first a sociologist, second a politician, and third a technician" (Frampton, 1992, p. 174). According to Okhitovich, a theorist of Russian constructivism, the object of the work of this new professional was not a constructed building *per se*, "but the construction, design of social relations, production functions in the form of buildings" (Khan-Magomedov, 2001, p. 191).

The content and purpose of architectural work becomes the formation or promotion of new needs, new programs of activity, new models of social structure and interaction, and new relationships between people. Once it has emerged, this strategy periodically resumes in architecture – in the concepts of "balanced neighborhoods", in the most radical versions of ecological settlements, in modern co-housing and co-living, etc.

The *third strategy* – rationing or regulation – is less rigid in relation to the perceived needs of a person. An architect who

follows it is rather a social engineer who has abandoned radicalism and messianism, but who considers it to be his or her professional duty to critically treat life "as it is" and social information as coming from outside. The need to implement regulatory functions is due to several reasons:

- splitting, fragmentation, stratification of modern society, in which the architect allegedly remains one of the few professionals able to speak on behalf of the social whole (Boyer, 1996, p. 32);
- the focus of the profession on acting *pro bono publico* (i.e., for the public good), and not in the name of private, selfish interests (Plunz and Chermaeff, 1982, p. 187); and
- understanding the fundamental error of focusing on the need "in its pure form" (after all, the doctor, explains Chermaeff, does not cut out the appendix just because the patient wants it) (*ibid*., p. 187).

The professional's confidence in his or her own right to evaluate and adjust human needs has deep roots in the history of architecture. Filarete stated that a poor man "needs a house of 10x12 cubits, without dividing into rooms", and a representative of the Russian post-revolutionary avant-garde said that "the worker does not need a mass of huge rooms with excessively luxurious decoration" (Glazychev, 1986, p. 346). The same confidence sounds in the text of the CIAM Declaration of 1928, adopted in La Sarraza. It proclaims that "rationalization and standardization react in a manner that they expect from the consumer (that is to say the customer who orders the house in which he will live) a revision of his demands in the direction of a readjustment to the new conditions of social life. Such a revision will be manifested in the reduction of certain individual needs henceforth devoid of real justification" (Frampton, 1992, p. 269). Wright (1970) expressed the same professional attitude, saying that "The needs and demands of the average client should affect every feature of a house but only insofar as the clients do manifest intelligence instead of exert mere personal idiosyncrasy" (Wright, 1970, p. 164).

The *fourth strategy* of "meeting the needs" has been mastered by the architectural thought of the new postmodern time. Developing since the 1950s, it was initially perceived as almost degrading architecture, since it questioned its messianic ambitions. The model of an architect engaged in the arrangement and decoration of life, and the registration and satisfaction of needs resembles, in the opinion of many, the role of a technologist, if not a waiter. Traces of this relationship are present, for example, in the words of Piedmont-Palladino (2000), who notes: "An architect who does not respect the client's wishes is likely to have a very short career, yet an architect who uncritically capitulates to those wishes risks abdicating his position of professional responsibility" (Piedmont-Palladino, 2000, p. 212).

Gradually, the goal of satisfying needs ceased to be perceived as something unworthy of an architect, and action on behalf of the consumer has acquired a civil sound. Convinced apologists of this model recall that for centuries the role of the architect as an intermediary between the client and the sphere of building production, acting 'to order', did not interfere with the high social status of the profession and the quality of architecture. But, nevertheless, the leading professional institutes of architects in the Codes of Professional Ethics, in the hierarchy of values and levels of responsibility of the architect move from global obligations to the "wider world", society as a whole then to local communities, and only then to end users and a specific client (AIA Code, 2020; RIBA Code, 2021). That is, socially responsible satisfaction of needs and reckless customer service are not synonymous.

The *fifth step* of the stairs is the strategy of assisting clients in the self-satisfaction of their needs. Here, the status of all participants in design and construction changes. The client ceases to be a consumer in the strict sense of the word and turns into a co-author of his own environment. The architect as a professional expert, neutral and distanced from the client, is replaced by an 'enabler' in order to "help people solve their own problems rather than dispensing wisdom and solutions from a distance" (Wates, 1987, p. 20).

The architect renounces the ideology of professional paternalism, and voluntarily rejects the right to impose design solutions on the client, no matter what noble considerations they may be caused by. In return, he or she offers professional knowledge and experience and, as a consultant, controlled by the client, participates with him or her in the procedure for creating a building. As a representative of the "social service" (Glazychev, 1986) acting not just on behalf of the client, but together with him, the architect contributes to the formation, awareness and self-realization of individual and social needs in relation to the environment, as well as to the organization and cohesion of communities during the implementation of environment making programs.

The words of Umberto Eco unveil the essence of the phenomenological 'embodiment' of needs on the *top step* of the stairs. According to him, the architect seeks to uncover the code of the "system of socially significant spatial values", without subjecting him or herself to the social norm, and not trying to "persuade people to a completely different way of life" (Stepanov, 1993, p. 151). This architect explores the client's *lifeworld* as phenomena of existence deeply hidden in the consciousness and subconscious, inaccessible to simple observation and not reduced to exposed desires. The architect acts on behalf of the inner, hidden essence of a person, and seeks to identify and implement immanent structures of activity in the built environment, more precisely, intentions for activity and interaction. In other words, he or she is engaged in the embodiment of life.

An architect who carries out "understanding design", as Nikitin (1990, p. 140) called it, is a figure that opposes all the models of the architect described above: an artist who is indifferent to social needs, a reformer who modifies the needs, or even a social partner who carefully cultivates the need in cooperation with his client (Nikitin, 1990). But the main opposition to the phenomenological embodiment is consumerism. According to Pallasmaa (1993), it is the consumer society that "tends to detach architecture from its existential base and turn it into a disposable commodity and entertainment" (Pallasmaa, 1993, p.75).

So, moving up the steps of needs from the bottom up demonstrates the process of humanization of the profession. Ideologically and artistically inspired neglect of real needs gives way to a practice of their partial correction. The willingness to work humbly for the consumer is being displaced by a desire to cooperate with him or her as a co-author of the built environment. The subtle and deeply hidden needs of the inhabitant are extracted from the consciousness with the help of complex phenomenological techniques and can push to create the best architecture that is not subject to rapid aging.

CONCLUSION

The diversity of the concept of need and the variability of the interpretation of human needs in architecture is an essential feature of architectural theory and practice. The need as a desire realized by the client, and its satisfaction as the content of the design work is just one of a number of possible strategies in the architect's activity. Each of these strategies is based on its own philosophical and ideological foundation, on its own interpretation of human nature. Each of them generates its own tradition of theorizing and a separate niche of professional activity. The very prospects for the development of science and the profession of architecture are connected with its self-determination in the field of ideas about human needs.

Addressing the archive and the arsenal of architectural knowledge shows that, in an academic sense, clarifying the concept of need can advance the theory of architecture in understanding not only its social origins, but also the validity of the very idea of the existence of these origins, which has been repeatedly questioned by postmodern authors. The concept of need is the most synthetic socio-spatial construction in which all the complexity of the human meets the integrity of the architectural.

For the architectural profession, the diversification of the concept of need and the ways of dealing with needs explains the fundamental nature of the separation of spheres of professional activity. The mass and elite submarkets, municipal architecture, the field of social and architectural experimentation, the expanding practice of participatory architecture – all of them rely on their own interpretations of the nature of human needs. The idea that the concept of need as the basis of design belongs to the past does not correspond to reality. An analysis of its history shows that this concept is developing, as well as other concepts that make up its theoretical context, which is quite enough to justify further study of this topic.

The mosaic nature of the concepts of need is of particular importance for architectural education. Its presentation in the course of teaching creates a semantic framework for considering a wide range of academic and professional attitudes, and suggests the future choice of the student's own positions, taking into account the clear ethical background of each of the strategies of working with need.

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REFERENCES

Alfirević, Đ., Simonović Alfirević, S. (2020). Achieving use value of a living space, *Spatium*, No. 44, pp. 22-28. https://doi.org/10.2298/SPAT2044022A

American Institute of Architects (AIA) (2020). *2020 Code of Ethics and Professional Conduct*. Washington, DC: AIA [online]. https://content.aia.org/sites/default/files/2020-12/2020_Code_of_Ethics.pdf [Accessed 5 May 2022]

Architects Registration Board (2010). *Prescription of Qualifications: ARB Criteria at Parts 1, 2 and 3*. ARB [online]. https://arb.org.uk/wp-content/uploads/2016/05/ARB_Criteria_123.pdf [Accessed: 5 May 2022].

Arnstein, S. A. (1969). A Ladder of Citizen Participation, *Journal of the American Planning Association*, Vol. 35, No. 4, pp. 216-224.

Beheiry, D. A., Gabr, H. S. (2022). The child as an active participant: enhancing the child's attachment to kindergartens through architectural design, *Archnet-IJAR*, Vol. 16 No. 1, pp. 46-68. https://doi.org/10.1108/ARCH-02-2021-0047

Bofill, R. (1993). Prostranstva dliya zhizni, Perevod s Frantsuzskogo (in Russian). In M. V. Predtechenskiy, A. N. Shukurova (Eds.), *Prostranstva dliya zhizni*. Moscow: Stroyizdat.

Boyer, E., Mitgang, L. (1996). *Building Community: a new future for architectural education and practice: a special report*. Princeton: The Carnegie Foundation for the Advancement of Teaching.

BREEAM (2017). *BREAM Communities Technical Manual*. Bregroup [online]. https://www.breeam.com/communitiesmanual/ [Accessed: 5 May 2022].

Brolin, B., Zeisel, J. (1972). Mass Housing: Social Research and Design. In G. Bell, J. Tyrwhitt (Eds.), *Human Identity in the Urban Environment*. London: Penguin Books Ltd, pp. 366-375.

Cherry, E. (1999). *Programming for Design: from theory to practice*. New York: John Wiley and Sons, Inc.

Cho, M. (2020). Residential satisfaction among low-income single-mother households: the case of residential welfare facilities in South Korea, *Archnet-IJAR*, Vol. 14, No. 3, pp. 359-378. https://doi.org/10.1108/ARCH-09-2019-0218

Cooper-Marcus, C. (1995). *House as a mirror of self: exploring the deeper meaning of home*. Berkeley, CA: Conari Press.

Erskine, R. (1984). Designing Between Clients and Users. In C. R. Hatch (Ed.), *The Scope of Social Architecture*. New York: Van Nostrand Reinhold, pp. 188-192.

Frampton, K. (1992). *Modern Architecture. A critical history* (3rd ed.). London: Thames and Hudson Ltd.

Glazychev, V. L. (1986). *Evolutsiya tvorchestva v arhitekture* (In Russian). Moscow: Stroyizdat.

Groat, L. N. (2000). A Conceptual Framework for Understanding the Designer's Role: Technician, Artist or Cultivator? In P. Knox, P. Ozolins (Eds.), *Design Professionals and the Built Environment: an introduction*. Chichester: John Wiley & Sons, Ltd. pp. 41-54.

Habraken, N. J. (1972). *Supports: an alternative to mass housing*. London: The Architectural Press.

Hertzberger, H. (1984). The Interaction of Form and Users. In C. R. Hatch (Ed.), *The Scope of Social Architecture*. New York: Van Nostrand Reinhold, pp. 13-19.

Hertzberger, H. (1992). *Lessons for students in architecture*. Rotterdam: Uitgeverij OTO Publishers.

Ikonnikov, A. V. (1990). *Esteticheskie tsennosti predmetno-prostranstvennoy sredy* (In Russian). Moscow: Stroyizdat.

Khan-Magomedov, S. O. (2001). *Arhitektura sovetskogo avangarda. Kniga 2. Sotsial'nye problemi* (In Russian). Moscow: Stroyizdat.

Kiyanenko, C. (1991). Mythology of Man and Environment in Social and Professional Consciousness. In T. Niit, M. Raudsepp, K. Liik (Eds.), *Environment and Social Development - Proceedings of the East-West Colloquium in Environmental Psychology*. Tallinn: Tallinn Pedagogical Institute, pp. 38-46.

Kiyanenko, K. V. (2003). Arhitektura, obrazovanie i kontseptsiya potrebnosti. In *Razvitie arhitekturno-hudozhestvennogo obrazovaniya v kontekste mirovoy kul'turnoy integratsii - Mezhdunarodnaya nauchno-metodicheskaya konferentsiya* (In Russian). Kazan: ZAO Novoe znanie, pp. 25-29.

Kiyanenko, K. V. (2005). *Arhitektura i sotsial'noe modelirovanie zhilishcha* (In Russian). (Doctoral dissertation, Moscow Architectural Institute, Moscow, Russia).

Kiyanenko, K. V. (2018). Paradigms of Social Knowledge and Validation in Architecture, *Sotsiologicheskie Issledovaniya*, No. 9, pp. 30-39. https://doi.org/10.31857/S013216250001956-4

Kroll, L. (1984). Anarchitecture. In C. R. Hatch (Ed.), *The Scope of Social Architecture*. New York: Van Nostrand Reinhold, pp. 167-181.

Le Corbusier (1927). *Towards a New Architecture*. Paris: Architectural Press.

Lerup, L. (1977). *Building the Unfinished: Architecture and Human Action*. Beverly Hills, London: Sage Publications.

Lynch, K. (1960). *The Image of the City*. Harvard: MIT Press.

Morris, E. W., Winter, M. (1978). *Housing, Family and Society*. New York, N.Y.: John Wiley & Sons.

National Council of Architectural Registration Boards (NCARB) (2020). *Architectural Experience Program Guidelines*. [online]. https://www.ncarb.org/sites/default/files/AXP-Guidelines.pdf [Accessed: 5 May 2022].

Nikitin, V. A. (1990). Sredovye intentsii I dvizhenie arhitekturnyh paradigm (In Russian). In A. A. Vysokovskiy, G. Z. Kaganov (Eds.), *Gorodskaya sreda: problemy sushchestvovaniya*. Moscow: VNIITAG, pp. 140-156.

Norberg-Schulz, C. (1996). The Phenomenon of Place. In K. Nesbitt (Ed.), *Theorizing a New Agenda For Architecture: An Anthology of Architectural Theory 1965-1995*. New York: Princeton Architectural Press, pp. 414-428.

Pallasmaa, J. (1993). From Metaphorical to Ecological Functionalism, *The Architectural Review*, No. 1156, pp. 74-79.

Pallasmaa, J. (1996). The Geometry of Feelings. A Look at the Phenomenology of Architecture. In K. Nesbitt (Ed.), *Theorizing a New Agenda For Architecture: An Anthology of Architectural Theory 1965-1995*. New York: Princeton Architectural Press, pp. 448-453.

Patel, T., Dorff, J., Baker, A. (2022). Development of special needs classroom prototypes to respond to the sensory needs of students with exceptionalities, *Archnet-IJAR*, Vol. 16 No. 2, pp. 339-358. https://doi.org/10.1108/ARCH-07-2021-0196

Piedmont-Palladino, S. (2000). The Design Professional in Service to the Community. In P. Knox, P. Ozolins (Eds.), *The Design Profession and the Built Environment: an introduction*. London and Sydney: John Wiley and Sons, Ltd., pp. 211-220.

Plunz, R. and Chermaeff, S. (1982). *Design and Public Good: Selected Writings 1930-1980*. Cambridge, MA.: MIT Press.

Prescription (2010). *Prescription of Qualifications: ARB Criteria at Parts 1, 2 and 3*. London: Architects Registration Board.

RIBA (2021). *RIBA Code of Professional Conduct*. RIBA [online]. https://www.architecture.com/knowledge-and-resources/resources-landing-page/code-of-professional-conduct [Accessed: 5 May 2022].

Rubanenko, B. R., Kartashova, K. K. (1981). *Perspektivy razvitiya zhilishcha v SSSR* (Vtoroe izdsnie) (In Russian). Moscow: Stroyizdat.

Salaheldin, M. H., Hassanain, M. A., Ibrahim, A. M. (2021). A systematic conduct of POE for polyclinic facilities in Saudi Arabia, *Archnet-IJAR*, Vol. 15, No. 2, pp. 344-363. https://doi.org/10.1108/ARCH-08-2020-0156

Salama, A. M. (2019). Methodological research in architecture and allied disciplines: Philosophical positions, frames of reference, and spheres of inquiry, *Archnet-IJAR: International Journal of Architectural Research*, Vol. 13, No. 1, pp. 8-24. https://doi.org/10.1108/ARCH-01-2019-0012

Sheykhmaleki, P., Yazdanfar, S. A. A., Litkouhi, S., Nazarian, M. Price, A. D. F. (2021). Prioritising public spaces architectural strategies for autistic users, *Archnet-IJAR*, Vol. 15, No. 3, pp. 555-570. https://doi.org/10.1108/ARCH-07-2020-0142

Shinohara, K. A. (1968). Theory of Residential Architecture, *Japan Architect,* No. 234, pp. 39-45.

Sirowy, B. (2010). *Phenomenological concepts in architecture: towards a user-oriented practice*. (Doctoral dissertation, University of Oslo, Oslo, Norway). https://www.researchgate.net/publication/327690202_Phenomenological_Concepts_in_Architecture_Towards_a_User-Oriented_Practice_A_PhD_Thesis [Accessed: 5 May 2022]

Stepanov, A. V., Nechaev, N. N., Ivanova, G. I. (1993). *Arhitektura i psihologiya - Uchebnik dliya vuzov* (In Russian). Moscow: Stroyizdat.

UIA (2017). *UIA Accord on Recommended International Standards of Professionalism in Architectural Practice*. Washington, DC: AIA.

UNESCO (2017). *UNESCO – UIA Charter for Architectural Education* (2017 edition). Paris: UIA.

Vuković, T., Salama, A. M., Mitrović, B., Devetaković, M. (2021). Assessing public open spaces in Belgrade – A quality of urban life perspective, *Archnet-IJAR*, Vol. 15 No. 3, pp. 505-523. https://doi.org/10.1108/ARCH-04-2020-0064

Wates, N., Knevitt, C. (1987). *Community Architecture: How People are Creating Their Own Environment*. London: Penguin Books.

Wright, F. L. (1970). *The Natural House*. New York: Meridian.

Zeisel, J. (2006). *Inquiry by Design: Environment/Behavior/Neuroscience in Architecture, Interiors, Landscape, and Planning*. New York: W.W. Norton & Company.

Zinchenko, A. P. (1981). Potrebnost' kak osnovanie processa proektirovaniya predmetno-prostranstvennoy sredy (In Russian). In T. Niit, M. Heidmets and J. Kruusvall (Eds.), *Man and the environment: psychological problems - Abstracts of a conference.* Tallinn: Estonian Branch of Psychologists' Society of the USSR, pp. 60-63.

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POSSIBILITIES FOR IMPLEMENTING PRINCIPLES OF A CIRCULAR ECONOMY IN THE RECONSTRUCTION AND ADAPTATION OF BUILDINGS IN SERBIA

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The circular economy is a new economic model which provides the necessary goods and services for maintaining and improving living standards without increasing the consumption of raw materials and waste. The traditional model of the linear economy is viewed as an unsustainable long-term solution because it does not take waste treatment into account, and thus the impact on the environment. The European Union has recognized this problem and obliged its members to apply the circular economy model as a strategy for a climate-neutral, resource-efficient, and competitive economy. By adopting the European Green Deal at the Western Balkans Summit, the Republic of Serbia has committed itself to abide by the new growth strategy, which includes the application of the circular economy in all industrial sectors. The construction industry is one of the most environmentally harmful industries in the world, with a direct impact on the use of raw materials, life cycle of buildings, and the overall environment. The paper explores the circular economy concept, its principles, and possibilities for implementation, both at the national level of the Republic of Serbia and the level of the European Union. The role of the circular economy in the construction industry has been examined through the analysis of legislation currently in force with regard to the treatment of construction materials and waste. This paper aims to highlight the importance of employing the circular economy in the Republic of Serbia, as well as to define guidelines for its further implementation, especially in the reconstruction and adaptation of buildings.

***Key words*: circular economy, building stock, construction, reconstruction, adaptation.**

INTRODUCTION

The exponential growth of the world's population and accelerated urbanization over the past few decades has significantly affected the quality of the environment and exploitation of natural non-renewable resources. It is estimated that half of the total greenhouse gas emissions and losses of more than 90% of biodiversity are caused by their acquirement and processing (European Commission, 2020a). These data indicate that the current linear economy model has reached its limits, and that it cannot be considered a sustainable long-term solution. A new economic model has been devised, known as the *circular economy*, in order to mitigate, and ultimately eliminate, the negative impact on the environment. It provides the necessary commodities and services for maintaining and improving living standards without increasing consumption of raw materials and waste.

Application of the circular economy model represents the inevitable future of all economic systems. The building construction sector, which is recognized as one of the most environmentally harmful industries in the world, and has a direct impact on the use of raw materials and the way they are used, is still in the early stages of transition from a linear to a circular economy (Bertino *et al*., 2021). Therefore, the research aims to define the possibility of implementing circular economy principles in the process of reconstructing and adapting buildings in the Republic of Serbia. The paper analyzes legislative acts and strategies for achieving climate neutrality by applying the circular economy model specified by the European Union, and comparing them with current

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regulations in the Republic of Serbia. The circular economy principles are identified through the aspects of energy and material management within the policies and guidelines, and their practical implementation.

THE CONCEPT OF A CIRCULAR ECONOMY

Today, the concept of a circular economy is becoming increasingly common in all economic activities, and it is often referred to as a new paradigm that will overcome the traditional barrier between the environment and economic prosperity (Pomponi and Moncaster, 2017). Along with the growth of interest in the issue, numerous schools of thought have been developed. Therefore, one can find various definitions of the circular economy in the literature, such as: increasing the productivity of raw materials instead of increasing the amount used; elimination of waste by treating used raw materials as future technical or biological components; maintaining or increasing the value of raw materials in environmental and economic terms; and planning within a circular system aimed at extending the life of raw materials and energy by using waste as an input. A comprehensive definition of the concept of a circular economy focuses on eco-design, cleaner production and ecological networks, in order to form a recycling-oriented society (Adams *et al*., 2017).

The previous socio-economic model, which is still the most widespread, is defined in the literature as the linear economy, and its crucial feature is the quantity of waste products after usage. The main disadvantage of this model is the erroneous assumption of infinite amounts of natural resources. The linear economy implies the use of resources ("take") and their disposal ("waste") (Figure 1). Theorists also characterize this system as "take, make, waste" or "from cradle to grave", as opposed to the circular "cradle to cradle" concept (Laumann and Tambo, 2018).

According to the European Commission (2020a), global consumption of resources such as biomass, fossil fuels, metals and minerals is expected to double in the next forty

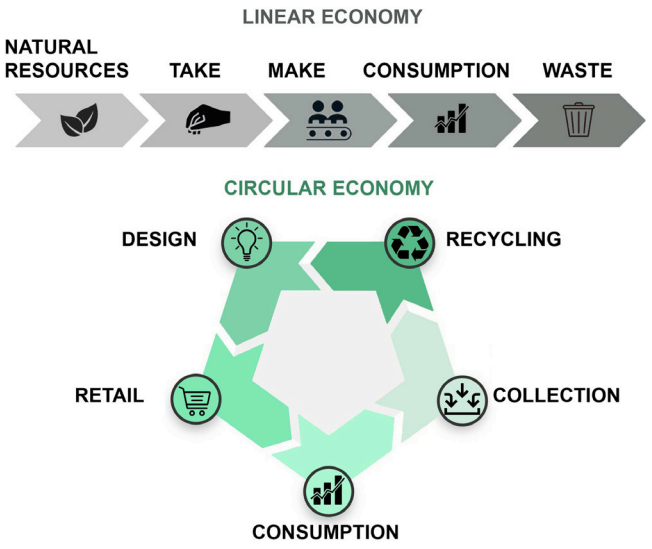

Figure 1. Comparative overview of linear and circular economics (Source: Jana Petrović)

years. In addition, an increase in annual waste production is estimated at 70% by 2050. According to the same source, considering the fact that half of the total greenhouse gas emissions and more than 90% of biodiversity loss are caused by the exploitation and processing of natural resources, the linear economy model cannot be considered a sustainable solution.

The gradually raised awareness of the soon-to-be-reached limits of the linear economy has sparked interest in forming a new economic model that would provide the necessary goods and services to maintain and improve living standards without increasing raw material consumption and waste. According to the traditional model, it was impossible to accept economic growth without increased exploitation of resources or raw materials, as stated after the global economic crisis in 2008 (Bonciul, 2014). Prosperity without growth represents a new paradigm because it requires a new attitude, a new perspective, which is represented by the circular economy.

The official position of the European Commission on the circular economy was presented for the first time on December 17, 2012, in a document titled "Manifesto for a resource-efficient Europe", where the first paragraph states: "In a world with growing pressures on resources and the environment, the EU has no choice but to go for the transition to a resource-efficient and ultimately regenerative circular economy." (European Commision, 2012). After that, the "The European Green Deal" (European Commision, 2019) launched an integrated strategy for a climate-neutral, resource-efficient and competitive economy. According to the European Commission, the utilization of the circular economy by leading economies should contribute to achieving climate neutrality by 2050 and separating economic growth from the use of resources, while ensuring long-term competitiveness of the EU and leaving no environmental footprint. The aim of adopting this type of economic model is to ensure regenerative growth, which means returning resources to the planet, limiting consumption, and reducing the ecological footprint (European Commission, 2020a). The circular economy model encompasses and merges different environmentally sustainable concepts, which makes it a very important model for a sustainable future.

Numerous countries have recognized the importance of the circular economy and formed legislative frameworks that support this model. Among the first countries, China stands out, where the Law on the Promotion of the Circular Economy was adopted in 2008, followed by the Netherlands, then the United States and France (Laumann and Tambo, 2018).

CIRCULAR ECONOMY IN THE REPUBLIC OF SERBIA AND WIDER REGION

According to data from a survey conducted by the Chamber of Commerce and Industry of Serbia, the concept of a circular economy in the Republic of Serbia is unknown to most respondents: 21.6% have never heard of it, while 60.5% have heard but are not familiar with the details (Privredna komora Srbije, 2022). Such results indicate insufficient information, but ultimately testify to its inadequate application. Although

the Republic of Serbia is an EU membership candidate, and therefore committed to implementing the circular economy concept (Mihajlov *et al*., 2019), it can be argued that it is only in its early stage of transition from a linear to a circular economy. On the other hand, the fact that 76.1% of respondents consider the application of a circular economy useful (Privredna komora Srbije, 2022) is encouraging, as well as the increasing public interest in a circular economy recorded year by year, according to the exponential growth in the number of related articles in written media, as well as the number of conferences and workshops organized (Mihajlov *et al*., 2019).

During the Stabilization and Association Process, EU directives represent principal non-binding guidelines for the Serbian administration refer to when devising contemporary legislation, such as national strategies and roadmaps on specific issues that are defined accordingly. More detailed programs or action plans may specify key elements, priorities, and methodologies for further application. A framework for the binding development of national, regional, and local laws and regulations is thus formed in order to operationalize the efforts. The following section presents the development path through the adopted strategies and laws important for the implementation of the circular economy in the Republic of Serbia and surrounding region.

At the Western Balkans Summit in Sofia on November 10, 2020, an agreement was signed in which the Western Balkan countries, including the Republic of Serbia, recognized the European Green Deal (Figure 2) as a new growth strategy of the European Union, for a modern, climate neutral, competitive, and resource-efficient economy. Thus, they laid the foundation for a major transformation of the region, which can turn the challenges of sustainability and flexibility into opportunities, and transfer elements of the European Green Deal to all interlinked priority sectors (Regional Cooperation Council, 2020). In accordance with this, the Circular Economy Action Plan, as a supporting document of the European Green Deal, will be analyzed as the most relevant document for the further economic development of the Republic of Serbia and the region, followed by the Roadmap for Circular Economy in Serbia, adopted in the same year by the Ministry of Environmental Protection (Mapa puta za cirkularnu ekonomiju u Srbiji, 2020).

Adopted in March 2020, the Circular Economy Action Plan (CAP) is the EU's industrial strategy to address two challenges: green and digital transformation. The purpose of the new action plan is to modernize the EU economy and to take advantage of the opportunities of the circular economy at national and international levels. The main goal of the

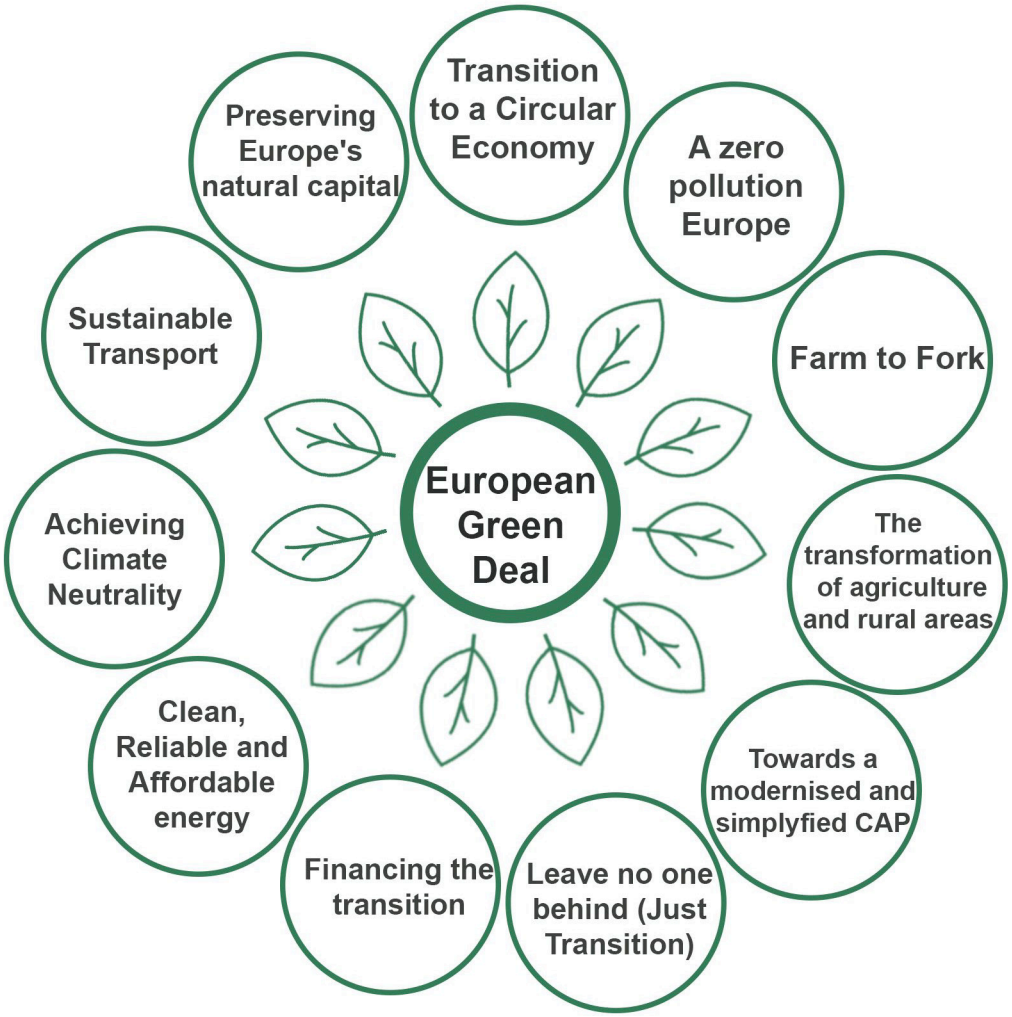

Figure 2. Goals of European Green Deal
(Source: Jana Petrović)

new policy framework is to encourage the development of leading markets for climate-neutral and circular products, both in the EU and beyond (European Commission, 2020a).

Designing sustainable products

The Circular Economy Action Plan includes a policy of "designing sustainable products" as a support to the circular design of all products, based on a common methodology and principles whose priority is to reduce and reuse materials before recycling. In this way, new business models are encouraged, and methods are defined to prevent the placing environmentally harmful products on the market, while increasing the responsibility of producers. Although the action plan is intended for the transition of all sectors, the action is especially focused on resource-intensive sectors. They are the textile, electronics and plastics sectors, in addition to the particularly influential sector of construction and buildings (European Commission, 2020a).

Empowering consumers and public buyers

The Circular Economy Action Plan also includes measures to encourage companies and enable consumers to choose durable, repairable products that can be reused. Furthermore, the Action Plan includes a requirements analysis for the "right to repair" and a change in the common concept of obsolescence of devices, especially electronic ones. Consumer protection policy should help people make well-founded decisions and take an active role in the ecological transition. New business models based on renting and sharing goods and services should be included if they are truly sustainable and affordable (European Commission, 2020a).

Circularity in production processes

Circularity is an essential part of the wider industrial transformation towards climate neutrality and long-term sustainability. It can provide significant savings in materials and production processes, increasing overall value and enhancing economic opportunities. Methods of achieving circularity include: assessing the possibilities for further promotion of the circular economy in industrial processes through examples of best practice on the best available techniques; development of evaluation and certification systems in production processes; supporting a sustainable and circular bio-sector through the implementation of the Bioeconomy Action Plan; promoting the use of digital technologies for monitoring and mapping resources, promoting the implementation of green technologies (European Commission, 2020a). Accompanied by the application of the framework for sustainable product policy, design methods, production and utilization should be radically changed, encouraging industry in the spirit of the circular economy and improvement of the digital sphere. A new industrial strategy for Europe is to support Europe's dual transition to a competitive industry and enhance its strategic autonomy (European Commission, 2020d).

The Republic of Serbia adopted timely national strategies that were in line with official EU recommendations and directives, even before receiving the official candidacy for accession to the European Union on March 1, 2012. Those strategies included the National Program of Environmental Protection (Službeni glasnik RS, br. 12/2010), the Waste Management Strategy (Službeni glasnik RS, br. 29/2010), the National Environmental Approximation Strategy (Službeni glasnik RS, br. 80/2011), and the National Strategies for Sustainable Use of Natural Resources and Goods (Službeni glasnik RS, br. 33/2012), which established the method of acknowledging universally adopted principles and policies regarding environmental treatment in the European Union, even though some of them were later replaced by more recent documents.

The Law on Environmental Protection (Službeni glasnik RS, br. 135/2004, 36/2009, 36/2009 - dr. zakon, 72/2009 - dr. zakon, 43/2011 - odluka US, 14/2016, 76/2018, 95/2018 - dr. zakon i 95/2018 - dr. zakon) defines a system of environmental protection which includes all levels of government, legal entities, and individuals. Their responsibility for any activity that affects or may affect the environment negatively is clearly determined, as well as the consequences for failing to take environmental protection measures in accordance with this law. It strongly emphasizes the necessity of raising awareness of the importance of environmental protection through the activities of governing bodies, public institutions and associations, the system of education, scientific research, and public information. Mutual coordination in decision-making and implementation is important, along with international cooperation. The majority of the basic principles in this law were taken from the National Program of Environmental Protection. It defines sustainable management of natural heritage through planning, control, and protection. Waste management implies acting within the system of collection, including preparation for reuse of the waste. These measures are primarily aimed towards preventing or reducing waste generation, as well as reuse and recycling, the separation of raw materials, and use of waste as an energy source, which highlight the need for adapting the concept of a circular economy.

Therefore, the Roadmap for the Circular Economy of the Republic of Serbia (*Mapa puta za cirkularnu ekonomiju u Srbiji*, 2020) is one in a series of documents prepared by the Republic of Serbia that introduced EU principles and directives into national regulations during the process of Stabilization and Association to the European Union. It introduces the notion of a circular economy into Serbian national regulations in order to encourage society to thoroughly change its "thinking, culture and attitudes towards resources", thus committing to changing public policies and dialogues. It is necessary to promote the application of circular business models that aim to create new jobs and improving business in Serbia through the implementation of sustainable solutions.

However, the utilization of the circular economy is still based on a few individual examples of good practice, mostly due to insufficient information and understanding of the concept, unavailability of funds, grants and subsidies, and consumer culture. Waste is characterized as problematic, given the "inadequate and outdated" waste management policy with unresolved issues from the past and problems in the application of regulations. In addition, the market for secondary raw materials is undeveloped and there is a low

level of awareness of the potential of waste as a raw material for production (*Mapa puta za cirkularnu ekonomiju u Srbiji*, 2020).

It is clear that the introduction of the circular economy requires a "multi-layered and multi-sectoral integration of national public policies and regulations" in order to create favorable conditions for investment, but also a consensus on the part of executive authorities on creating a "policy of sustainable use of resources in the context of circular economy". Furthermore, two parallel transitions are defined: the transition to a circular economy and digital transformation, which are mutually assisted. Priority is given to the use of renewable energy sources with efficient use, innovative technologies, green public procurement, replacement of hazardous substances, and changes in consumer habits in Serbia (*ibid.*).

CONSTRUCTION AND THE CIRCULAR ECONOMY

The construction industry is considered to be one of the most environmentally harmful industries in the world, which has a direct impact on how raw materials are processed and used, the life cycle of buildings, and the impact on the overall environment. However, the construction sector is still in the early stages of transition from a linear to a circular economy (Bertino *et al*., 2021). In the 1990s, buildings were responsible for 40% of the use of material resources and a third of the energy consumed globally (Pomponi and Moncaster, 2017). Three decades later, the construction sector is still one of the world's largest consumers of raw materials and carbon dioxide emissions. Globally, buildings are responsible for 40% of the total registered waste (by volume), 40% of the total use of material resources (by volume) and 33% of the total emissions of gases caused by human activities (Eberhardt *et al*., 2020).

According to a European Commission report, it is estimated that the construction sector is responsible for over 35% of total waste generation in the EU. Additionally, greenhouse gas emissions from material exploitation, production, construction, and reconstruction account for 5-12% of total emissions. By using materials that have higher efficiency, those figures could reduce up to 80% of greenhouse gas emissions (European Commission, 2020a).

Improvement strategies include the transition to a circular economy, which will have a positive impact on achieving climate neutrality, energy efficiency of buildings, efficiency of materials and construction waste management, also extending the lifecycle of buildings. Some of the circular economy principles include: the use of recyclable construction products or those produced from recycled raw materials; promoting measures to increase the lifecycle of buildings; implementing lifecycle assessment in public procurement; establishing legislative frameworks for construction waste management; promoting initiatives to reduce soil pollution through the rehabilitation of abandoned brownfields, and increasing the safe, sustainable, circular use of excavated soil (European Commission, 2020a). Extending the life cycle of buildings implies a "closed loop system" in which all elements and materials are optimally used and maintained at their highest value (Rahla *et al*., 2021).

The regulation for determining conditions for placing construction products on the market was established in 2011 (European Union, 2011). Sustainable use of natural resources is implied within the basic requirements for construction works; however, particular attention should be paid to recyclability and reusability, durability of construction works, and the use of environmentally friendly raw materials and secondary materials. The Law on Construction Products of the Republic of Serbia (Službeni glasnik RS, br. 83/2018) is based on the stated principles, and indicates the beginning of digitalization of the sector, following the trend of digital transition, by means of "electronic contact points for construction products", as a way of providing information on technical regulations in force, competent authorities and legal means. On the other hand, the law indicates the life cycle of construction products as a sequence of consecutive and interconnected phases of life, spanning from obtaining the raw materials or production to their permanent disposal, which demonstrates the presence of linear thinking in the economic regulations for production in Serbia that are still in force. Furthermore, it emphasizes the importance of enhancement according to the current knowledge and policy harmonization.

The comprehensive goals of a circular economy in architectural design and construction practice can be summarized as reduction of waste, optimization of material use, control of the impact of design, and a choice of materials that consider the environment throughout the lifecycle of a building (European Commission, 2020b). To achieve these goals, all actors in the process of construction and use of buildings (users, designers, contractors, manufacturers, investors, and regulating authorities) must respect the principles of a circular economy, three of which stand out as the most dominant:

- Durability: medium length to long term planning for the life of buildings, as well as all associated elements (materials, installations, etc.);
- Adaptability: prolonging the lifespan of buildings, in terms of repurposing their function, including changes of usage for certain elements; and
- Waste reduction and enabling high quality waste management: future circular use of construction materials, products and parts should be enabled, with a focus on waste reduction and the potential for reuse or high-quality recycling after reconstruction or adaptation. This process includes: 1) reusing or recycling materials so that most of the value of the material is retained and restored at the end of the life of the building; and 2) design of parts and use of different construction methods in order to influence reuse or recycling (European Commission, 2020b).

Considering the prominence of waste management as a means of enabling the circular economy (Mihajlov *et al*., 2021), it is important to consider the current Waste Management Program of the Republic of Serbia for the Period 2022-2031 (Službeni glasnik RS, br. 12/2022), recognizing the interconnection, preceded by the Waste Management Strategy 2010-2019 (Službeni glasnik RS, br. 29/2010) that set an integrated waste management system but resulted in insufficient recycling rates and application

of economic instruments. With the vision of controlling waste generation, waste recovery and economic incentives by applying the circular economy, the program anticipates reducing environmental pressures and improving the quality of life. In that sense, it defines general and specific objectives, as well as measures and instruments, such as necessary infrastructure, economic instruments, and performance indicators for monitoring implementation of the program. With classification of waste being based on its content and industry, waste from construction and demolition, which is of particular interest to us, has been identified as a special waste stream that requires specific regulations, since only metal waste has been collected on a larger scale, in contrast to very small amounts of other components.

Furthermore, in the Republic of Serbia, building construction is one of the sectors with the highest greenhouse gas emissions after the energy sector, manufacturing, and transport (*Mapa puta za cirkularnu ekonomiju u Srbiji*, 2020). Five areas have been defined to represent the key for implementation of the circular economy, which would contribute to the missing reduction of global greenhouse gas emissions, following decarbonization of the energy sector by switching to renewable energy sources. These areas include cement, plastic, steel, aluminum, and food, four of which are closely related to the construction industry. Therefore, construction in Serbia is one of the primary sectors selected for the transition to a circular economy, and for applying this concept in the fastest and most adequate way, based on its recognized potential. Two segments have been singled out: construction from environmentally friendly materials with the application of circular design, and reduction of demolition and construction waste.

It is possible to recycle up to 80% of construction waste, but in Serbia the quantity recycled is unknown, since there are no suitable landfills for this type of waste, and so it is mixed with other waste. This certainly does not mean that construction waste landfills should be planned, because, in the spirit of the circular economy, their use should be considered with the aim of eliminating waste through sustainable business models. Specific recommendations are the adaptation and reconstruction of buildings in order to eliminate waste, the promotion of sustainable construction, and the use of environmental materials (*ibid*.).

RENOVATION WAVE AS A CIRCULAR MODEL FOR BUILDING STOCK MANAGEMENT

Renovation is one of the circular economy strategies to prevent waste generation in construction, and also one of the key strategies for achieving climate neutrality. According to the *Renovation Wave* document (European Commission, 2020c), the reason for considering launching such an endeavor is due to several facts: most of the existing buildings units in the EU do not meet minimum requirements for energy efficiency, about 85% of them were built before 2001, and 85-95% of them will still exist in 2050. The current renovation rate of 11% in the EU does not entail an improvement in energy performance, which is estimated to be present at only about 1%. At the same time, *deep* renovations, which reduce energy consumption by over 60%, are performed on about 0.2% of the building stock annually. Such renovations are expected to reduce the pressure for greenfield construction, thus supporting the preservation of nature, biodiversity, and valuable agricultural land.

The key principle for building renovation is 'energy efficiency first', followed by affordability, decarbonization and integration of renewables, circularity, high standards of health and environmental protection, green and digital transition, respect for aesthetics and quality of architecture. According to the existing regulations in these fields, the minimum conditions and efficient targeted investments have yet to be determined, along with education and promotion of the sustainable built environment (European Commission, 2020c).

Improvement of the building stock is mainly focused on renovating structures with the weakest performance – which includes a fight against energy poverty in regulatory, structural, financial and any other sense; and renovating public buildings, such as administrative, educational, and health facilities – in order to improve them, as well as to promote the concept (*ibid*.).

MATERIAL ASPECTS OF IMPROVING THE BUILDING STOCK IN SERBIA

The Directives on the energy performance of buildings and energy efficiency, adopted during 2010 and 2012 are still valid in the European Union (European Union, 2010; European Union, 2012). The methodology of calculating energy performance includes thermal characteristics, heating and air-conditioning, energy from renewable sources, elements of passive heating and cooling, shading, indoor air quality, natural light and the building's design. According to existing EU standards, energy performance calculations throughout the year, and not only during the heating season, show the energy to be consumed for the needs of the building annually – heating, cooling, domestic hot water, etc. The aspects affecting the material component most directly, and are included in the calculation of energy performance, are the thermal characteristics of the structure, such as heat capacity and insulation. The importance of energy efficiency and energy improvement of the existing building stock lies in preserving the buildings and their material values, as well as prolonging their lifecycle. Based on the energy performance, buildings receive an energy certification, for which there is a basic mechanism of implementation and control. Holders of public authority "should lead by example" and apply recommendations for improving energy efficiency in public buildings. European funds help promote advocacy for *green technologies* and the development of energy efficient systems and materials for new and renovated structures. They are applied at national, regional, and local levels for the EU Member States (European Union, 2010).

The 2012 directive defines the notion of energy efficiency, which decreases the primary energy consumption, thus reducing energy imports and enhancing the security of energy supply. It also directly lowers greenhouse gas emissions and mitigates the effects of climate change. Accelerating the development of innovative technical solutions strengthens economic growth and creates new

business opportunities. In quantitative terms, energy efficiency is the ratio of performance, services, supplies, or energy to energy intake. It is especially important to set energy performance requirements for the elements that form part of the building envelope (European Union, 2012).

The latest such directive, passed in 2018, through its amendments, in particular predicts general decarbonization of the building stock by 2050, while acknowledging the minimum requirements for energy performance according to local regulations both for new and renovated buildings (European Union, 2018).

Buildings that are under legal protection, such as cultural monuments, represent an exception to this rule, where the application of energy efficiency regulations is not mandatory while performing interventions. However, due to awareness of the necessity for improving the building stock, "Guidelines for improving the energy performance of historic buildings" were given in 2016, in the form of the European Standard for Conservation of Cultural Heritage (European Standard, 2016), which was subsequently adopted in Serbia. It serves as an addendum to existing energy performance standards for construction, with a focus on the specific qualities that these structures possess as immovable tangible cultural heritage. The guidelines can be applied to a wide range of structures that need special consideration of energy performance, building use and conservation, in order to find a sustainable balance. They include a systematic approach to individual situations, for the purpose of reaching the most optimal solution and selecting appropriate measures in each particular case, with an assessment of the impact of selected procedures on the preservation of "character-defining elements" of the said heritage.

In terms of general regulations in the field of building construction in Serbia, the principal legislation is the Law on Planning and Construction (Službeni glasnik RS, br. 72/2009, 81/2009 - ispr., 64/2010 - odluka US, 24/2011, 121/2012, 42/2013 - odluka US, 50/2013 - odluka US, 98/2013 - odluka US, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - dr. zakon, 9/2020 i 52/2021). According to this law, one of the basic principles for organizing and using space is the principle of sustainable development through an integrated approach to planning. It represents harmonization of all aspects of development, rational use of non-renewable resources and providing conditions for substantial use of renewables. Sustainable construction is ensured by applying technical measures, standards and requirements in all phases of planning, design, construction and the use of structures and spaces. Energy properties of a building should enable energy savings by reducing consumption of all types of energy. Construction products and materials should meet the requirements specified by law and special regulations, as well as basic requests regarding buildings, and technical demands in specific fields. An integrated procedure that includes use of a digital platform for submission of technical documentation and applications throughout all phases of planning and construction, not only contributes to efficient ruling in particular cases, but also supports the digital transition in one of its most influential spheres.

The Rulebook on Energy Efficiency (Službeni glasnik RS, br. 61/2011) is the current regulation of the Republic of Serbia which sets technical requirements and parameters related to the energy properties of new and existing structures. These requirements are important for the circular model of improving the built environment, as well as its comfort conditions. The rulebook defines terms (physical quantities, labels, units, indexes) and their values used for calculating all aspects of energy properties and consumption. It includes a method for determining the thermal properties of buildings and specifies the contents of energy efficiency studies, as they are a mandatory part of the technical documentation intended for acquiring permits for construction or intervention on existing structures. It also introduces the concept of energy rehabilitation, which is aimed at increasing the energy efficiency of existing buildings. The process must not affect the stability or safety of buildings, or the fire protection and environmental protection, but it can change the exterior appearance, if the necessary approvals are obtained. Major renovation, in accordance with European standards, means performing adaptation or rehabilitation works with an estimated value of at least 25% of the value of the building (land included), or subjecting a minimum of 25% of the envelope to energy rehabilitation.

The Rulebook on Conditions, Content and Manner of Issuance of Certificates of Energy Performance of Buildings (Službeni glasnik RS, br. 69/2012 i 44/2018 - dr. zakon) prescribes the process of building certification after passing building inspection, as part of the technical documentation needed for obtaining a use permit. It introduces the concept of energy classes to indicate the energy performance of buildings in the standardized form of an Energy Passport, for residential, non-residential or other buildings that use energy. A class of C or higher is obligatory for all new buildings, whereas improvement by at least one class is required for energy rehabilitation and other interventions.

TREATMENT OF MATERIALS WITHIN THE CONCEPT OF A CIRCULAR ECONOMY

As previously stated, the overall goals of a circular economy in architectural and construction practice can be summarized as: reducing waste, optimizing the use of materials, and controlling the impact of design and choice of materials on the environment during the life cycle of a building (European Commission, 2020b). Correspondingly, the treatment of materials in reconstruction and adaptation can be carried out through two methods:

- recycling of existing (found) materials or construction elements – waste becomes a resource;
- using recyclable materials where recycling of previously applied materials is not possible.

Recycling existing materials or building elements implies a complex series of activities, whose long-term goal is to extend the life of the building without negative impacts on the environment. According to Blomsma (Blomsma, 2016; Blomsma *et al*., 2018) some of the mentioned activities include:

- **Direct reuse** of the same material or element without any additional intervention. In the process of

reconstruction and adaptation of buildings, this type of use can be interpreted in two ways: material or elements intended for demolition can be implemented in a new design without additional processing (example: reuse of bricks in landscaping as a type of paving) or sold through product sharing platforms. The application of this principle enables a positive economic and environmental effect – savings are made through the quantity of materials used or earnings due to sales, and the environmental impact is reduced. Expenditure is mainly recognized as the cost of logistics, storage, or organizing exchange between clients;

- **Surface corrections** are made on products whose direct reuse is not possible, or they contain expendable parts that are expected to be further surface treated before reuse. From the architectural standpoint, the processes within this approach include dismantling, followed by surface corrections and reuse (example: a wooden roof structure in good condition can optionally be dismantled, surface treated and reused). The benefits of this principle are the same as those previously analyzed, while the costs of logistics can be reduced;
- **Reconfiguration** is the process by which a product is disassembled, and then assembled in a different configuration. It can be applied to most building materials such as wood, brick, concrete, and even glass. However, the efficiency of reconfiguration depends on the complexity of the process – in some cases the process may be more expensive than buying new and recycling old, so a cost-effectiveness analysis is needed (example: use of wooden structural elements in the production of urban furniture); and
- **Improvement – Innovation** is a special case of designing a product that would be able to be innovated in future life cycles. Therefore, in addition to the reconfiguration model that expands the range of product usability and prolongs the product life cycle, a time dimension is added, in which innovations are expected in the design of more complex products and a production base is set up to support new, more efficient, or multifunctional products. Important expenses of this system are market planning, as well as designing products that are resilient over an extended period of time, while a significant benefit factor is the creation of an ecosystem of products that is somewhat dependent on the primary manufacturer.

The use of recyclable materials is an alternative when none of the mentioned processes is possible. Their benefit is environmental by nature (recyclability), while the costs may be higher than the proposed systems previously analyzed.

CONCLUSION

The official position of the European Commission is that use of the circular economy will contribute to achieving climate neutrality by 2050, as well as provide regenerative growth in the form of returning resources to the planet, limiting consumption, and reducing the ecological footprint (European Commission, 2020a). The Republic of Serbia's recognition of the European Green Deal, as well as the Circular Economy Action Plan, its supporting document, came with the obligation to adopt, develop, and apply the circular economy as a principle for further economic development. For that cause, a strategy has been established in the form of the Roadmap for the Circular Economy in Serbia, adopted by the Ministry of Environmental Protection. However, in practice, more significant results have been lacking and the application of the circular economy is still present only in a small number of separate examples. The following problems were identified as crucial: insufficient information and overall understanding of the concept, unavailability of funds, grants, and subsidies, consumer culture, inadequate waste management policy, and an underdeveloped secondary raw materials market (*Mapa puta za cirkularnu ekonomiju u Srbiji*, 2020).

Although there is a tendency in the Republic of Serbia to follow international legislation and adopt their equivalents within national regulations, practical barriers for implementation are evident, given the insignificant improvement of the building stock and the slight movement of the construction industry towards circular economy models. Despite these facts, the potential is great and there is a clear determination to raise awareness and apply the acknowledged principles. Improving the possibility of applying the principles of a circular economy in reconstruction and adaptation is feasible through:

- determining the conditions on the market for placing construction products which ensure recyclability and reusability, durability of construction works, use of environmentally compatible raw materials and secondary materials;
- using alternative sources of energy and ensuring minimum conditions for the energy efficiency of buildings; and
- promotion and education with regard to the circular economy as a sustainable economic model of the future.

European Union plans regarding construction materials, as well as harmonized national regulations of the Republic of Serbia, define not only the application of energy efficient materials and solutions, but also the entire process from extraction to the end of the use of finished products – in the spirit of the circular economy, maximizing opportunities for reuse and recycling, while minimizing the usage of raw materials, waste, and pollution. The circular economy model encompasses and merges different environmentally sustainable concepts, which makes it very important in terms of enabling a sustainable future. Promoting the application of circular business models enables the creation of new jobs and the improvement of business in Serbia through the application of sustainable solutions.

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REFERENCES

Adams, K. T., Osmani, M., Thorpe, A., Thornback, J. (2017). Circular economy in construction: current awareness, challenges and

enablers, *Waste and Resource Management*, Vol. 170, No. 1, pp. 15-24. https://doi.org/10.1680/jwarm.16.00011

Bertino, G., Kisser, J., Zeilinger, J., Langergraber, G., Fischer, T., Österreicher, D. (2021). Fundamentals of Building Deconstruction as a Circular Economy Strategy for the Reuse of Construction Materials, *Applied Sciences*, Vol. 11, No. 939, pp. 1-30. https://doi.org/10.3390/app11030939

Blomsma, F. (2016). *Making sense of circular economy - how practitioners interpret and use the idea of resource life-extension*. (Doctoral dissertation, Centre for Environmental Policy, Imperial College London, London, UK). https://spiral.imperial.ac.uk/handle/10044/1/47907 [Accessed: 20 Feb 2022].

Blomsma, F., Kjær, L., Pigosso, D., McAloone, T., Lloyd, S. (2018). Exploring Circular Strategy Combinations - towards Understanding the Role of PSS, *Procedia CIRP* 69, Vol. 69, pp. 752-757. https://doi.org/10.1016/j.procir.2017.11.129

Bonciu, F. (2014). The European economy: From linear to circular economy, *Romanian Journal of European Affairs*, Vol. 14, No. 4, pp. 78-91.

Eberhardt, L. C. M., Birkved, M., Birgisdottir, H. (2020). Building design and construction strategies for a circular economy, *Architectural Engineering and Design Management*, Vol. 18, No. 2, pp. 93-113. https://doi.org/10.1080/17452007.2020.1781588

European Commission (2012). *Manifesto for a resource-efficient Europe*. Brussels: European Commission.

European Commission (2019). *The European Green Deal*. Brussels: European Commission.

European Commission (2020a). *A New Circular Economy Action Plan For a cleaner and more competitive Europe*. Brussels: European Commission.

European Commission (2020b). *Circular Economy Principles for Building Design*. Brussels: European Commission.

European Commission (2020c). *A Renovation Wave for Europe – Greening of Buildings, Creating Jobs, Improving Lives*. Brussels: European Commission.

European Commission (2020d). *A New Industrial Strategy for Europe*. Brussels: European Commission.

European Standard (2016). *Conservation of Cultural Heritage - Guidelines for improving the energy performance of historic buildings*. Luxembourg: European Union.

European Union (2010). *Directive 2010/31/EU on the energy performance of building (recast)*. Official journal of the European Union, Vol. L 153, pp. 13-35.

European Union (2011). *Regulation (EU) laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC*. Official Journal of the European Union, Vol. L 88, pp. 5-43.

European Union (2012). *Directive 2012/27/EU on energy efficiency*. Official journal of the European Union, Vol. L 315, pp. 1-56.

European Union (2018). *Directive (EU) 2018/844 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency*. Official journal of the European Union, Vol. L 156, pp.75-91.

Laumann, F., Tambo, T. (2018). Enterprise Architecture for a Facilitated Transformation from a Linear to a Circular Economy, *Sustainability*, Vol. 10, No. 3882, pp. 1-16. https://doi.org/10.3390/su10113882

Mapa puta za cirkularnu ekonomiju u Srbiji (2020). Beograd: Ministarstvo zaštite životne sredine.

Mihajlov, A., Mladenović, A., Jovanović, F. (2019). *Circular economy in Serbia: process started*. Belgrade: Environmental Ambassadors for Sustainable Development (EASD).

Mihajlov, A., Mladenović, A., Jovanović, F. (2021). Country in Transition (Serbia) Case: Circular Economy Starts from Waste Management, *Environmental Research & Technology*, Vol. 4, No. 1, pp. 83-88.

Pomponi, F., Moncaster, A. (2017). Circular economy for the built environment: A research framework. *Journal of Cleaner Production*, Vol. 143, No. pp. 710-718. https://doi.org/10.1016/j.jclepro.2016.12.055

Privredna komora Srbije (2022). *Stanje cirkularne ekonomije u Srbiji 2021/2022*. Beograd: Privredna komora Srbije.

Rahla, K. M., Mateus, R., Bragança, L. (2021). Implementing Circular Economy Strategies in Buildings—From Theory to Practice, *Applied System Innovation*, Vol. 4, No. 26, pp. 1-14. https://doi.org/10.3390/asi4020026

Regional Cooperation Council (2020). *Sofia Declaration on the Green Agenda for the Western Balkans*. Sofia: Regional Cooperation Council.

Službeni glasnik RS (br. 12/2010). *Nacionalni program zaštite životne sredine* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 29/2010). *Strategija upravljanja otpadom za period 2010-2019. godine* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 80/2011). *Nacionalna strategija za aproksimaciju u oblasti životne sredine za Republiku Srbiju* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 61/2011). *Pravilnik o energetskoj efikasnosti objekata* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 33/2012). *Nacionalna strategija održivog korišćenja prirodnih resursa i dobara* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 135/2004, 36/2009, 36/2009 - dr. zakon, 72/2009 - dr. zakon, 43/2011 - odluka US, 14/2016, 76/2018, 95/2018 - dr. zakon i 95/2018 - dr. zakon). *Zakon o zaštiti životne sredine* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 83/2018). *Zakon o građevinskim proizvodima* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 69/2012 i 44/2018 - dr. zakon). *Pravilnik o uslovima, sadržini i načinu izdavanja sertifikata o energetskim svojstvima zgrada* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 72/2009, 81/2009 - ispr., 64/2010 - odluka US, 24/2011, 121/2012, 42/2013 - odluka US, 50/2013 - odluka US, 98/2013 - odluka US, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - dr. zakon, 9/2020 i 52/2021). *Zakon o planiranju i izgradnji* (in Serbian). Belgrade: JP „Službeni glasnik".

Službeni glasnik RS (br. 12/2022). *Program upravljanja otpadom u Republici Srbiji za period 2022-2031. godine* (in Serbian). Belgrade: JP „Službeni glasnik".

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AESTHETIC COMMUNICATION DISCOURSE OF URBAN DESIGN FOR FOURTH ORDER DESIGN IN SUSTAINABLE URBAN REGENERATION

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The research examines several aspects of urban design in order to build on its integrative potential for sustainable urban regeneration. It will discuss the concept and definition of urban design to support the claim that process-oriented urban design can foster creative integration, despite opposing urban development paradigms for fourth-order design. Sustainable urban regeneration will be studied via the perspective of aesthetics in communication as the primary integrative instrument of fourth-order design. The paper presents a theoretical and conceptual overview of numerous integrating elements of urban design. Thus, the process of philosophical and theoretical comparisons is utilized within the disciplines of sustainability, communication, and aesthetics.

***Key words*: urban design, urban regeneration, sustainability, communicology, aesthetics.**

INTRODUCTION

The complexity of globalisation has introduced the story of identity as a carrier of socio-economic development, and therefore the focus is changing with regard to the relationship between urban planning and design in the context of urban regeneration. In a global society, the power of local identity has become very strong in the race for the global market. Castells (2000) defines several areas of urban goals that support the preservation and development of local identity:

- realization of urban demands for changed conditions and ways of life;
- affirmation of local cultural identity; and
- political autonomy of the local and citizen participation.

"People must organise around urban movements (which are not extremely revolutionary) through which they will discover and define common interests in places of community and new meaning" (Castells, 2004, p. 64). According to Madanipour (1996), urban design, as a carrier of multidimensional place quality factors, is the backbone in the regeneration and creation of integral space. The artistic dimension of urban design allows re-examination of its role as the dominant discipline in the process of urban regeneration. Understood as a communicative and collaborative process, it can create a framework for the regeneration and integration of sustainability dimensions.

Numerous theoretical and conceptual perspectives of urban design are integrated throughout the text. Thus, sectors as diverse as sustainability, communication, and aesthetics employ the process of philosophical and theoretical comparisons. Discussion will lead to an examination of urban design's integrative potential for fostering sustainable community-led urban regeneration. The special scientific contribution of the paper is made in the communicative aspects of urban design, where the aesthetic of communication is researched as an integrative instrument for sustainable places. It is discussed within Habermass' (1984) theory of communicative action in order to enable Dovey's (1999) places of power-to rather than power-over. Thus, they support a sustainable harmonisation process based on equity and the right to participation.

The second chapter discusses the subject of urban regeneration and its connection with the process of urban design. In this section, urban regeneration is considered as a process that affirms existing and creates new ambient values through the formation of multidimensional, integral space

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and the creation of a glocal place.[2] The dominant aspects of the urban design process will be related to different urban paradigms.

The third chapter discusses the communicative and aesthetic aspects of urban design as a factor in the integration of different interests, values, attitudes, and commitments in Buchanan's fourth order of design (Buchanan, 1992), towards designing an integral place of sustainable regeneration. This discussion mostly looks at the integrative dimension of urban design in the fields of creativity, aesthetics, and communication.

SUSTAINABLE URBAN REGENERATION AND URBAN DESIGN PROCESS

This section considers urban regeneration as a process of affirming existing and creating new ambient values through the formation of multidimensional, integral space and the creation of a glocal place. The subject of urban regeneration is the integral affirmation and creation of environmental values. The process of integral formation of ambient values should establish a polygon for the affirmation of existing and the creation of new urban architectural patterns and values into one coherent whole. The main position in the research is that ambient values are related to the qualitative characteristics of places that, in an integrated approach, establish a holistic relationship with different spatial concepts of urban paradigms: (1) sustainable-global, local, glocal space; (2) collaborative-shared, common space, multidimensional, institutional, social; (3) environmental blue/green spaces, open spaces, protected spaces; (4) social-social space, perceptual space, personal space; (5) physical three-dimensional space; (6) economic space (Reeves, 2005).

Table 1 shows the relationship between urban paradigms, the concept of space and place in which it is theoretically and practically applied, the subject of urban regeneration in relation to the understanding of well-being, and the type of urban regeneration that emerges from the previous factors. The content of the table indicates that the domain of urban regeneration has expanded over time from the economic and physical understanding of improvement, through social, to an integral understanding. An integral or sustainable approach to urban regeneration encompasses spatial and theoretical conceptions of previous paradigms. Also, the table is a starting point for discussing the integrative

Table 1. The subject of urban regeneration in relation to the urban paradigm and concept of space (Source: Mrđenović, 2011; 2013)

Paradigm	Concept of space	Subject of urban regeneration	Type of created place
Economic	Economic space	Economic variables of space	Large scale reconstructed places
Social	Social space	Social and environmental healing	Places for healing and preventing diseases (open public spaces)
Physical	Physical (Euclid/s) space	Healing through physical artefacts	Beautiful, iconic places
Public administration	Bureaucratic space or planning agencies	Coordination of different sectors and levels of government in solving urban problems and 'healing'	Technicist, functionalist
Environmental	Biospaces, natural spaces	Betterment though greening	Blue-green places, as places that are led by natural resources of water and greenery
Collaborative	Shared places	Healing through common sense	Integration of different relativized values and types of rationality
Sustainable	Integrated space	Unification of previous conceptions of space as a principle of betterment	Integration of different paradigms, development sectors, levels of government, development agencies and actors, understanding of improvement, objectification and argumentation of different values.
Transitional	Transitional glocal space	Developmental holism	Developmental attachment, transitional glocal place

[2] There is a significant distinction between the two forms of design for sustainability and their relation to creating place: transitional and integrative. While transitional design, according to Kossoff, should lead to community in line with the Max-Next concept within a transitional initiative (Kossoff, 2015; Kossoff et al., 2015; Max-Neef, 2010), that kind of society can be isolated in global society. Thus, they are both protected from its dark sides and cut off from the benefits globalisation brings to localities. Despite the fact that Kossoff (2019) speaks of cosmopolitan globalism, the author advocates for the notion of glocalism, which symbolises Castells' project identity (Castells, 2004). Creating a glocal place requires the use of mimicry of the past over the present towards a future consensual identity of place. Therefore, a glocal place integrates local identities into the framework of global standards of the place towards a higher harmonisation process.

dimension of urban design in the process of sustainable urban regeneration.

The concept of urban design, i.e., its definition, is very vague, so the research will focus on assessment-oriented urban design, as defined by Madanipour (1996). According to Madanipour (1996), definitions of urban design can be classified into several arenas that determine aspects of its perception: (1) the spatial dimension to which it refers; (2) visual or volumetric accentuation of urban design; (3) physical or social aspects; (4) the relationship between the process and the product of urban design; (5) the relationship between different professionals and participants in the process; (6) the public or private domain of urban design; and (7) the objective-rational or subjective-expressive process. According to this author, the multidimensional nature of the definition of urban design should be distinguished from the complexity of its subject matter, i.e., the shaping of urban space.

Dominant aspects of the urban design process can be related to different urban paradigms. Consequently, the approach and understanding of urban design has the same relation to paradigmatic positions as urban regeneration. This means that urban design can be related to the spatial concept of the dominant urban paradigm. Then the spatial concept becomes the common denominator of urban regeneration and urban design. Therefore, urban design is inseparable from socio-spatial relations and favoured paradigmatic positions. "Current theoretical thought in the field of architectural and urban design [...] unites the physical and social dimension of space" (Bazik, 1996, p. 84). Urban design, therefore, can be seen as a process of shaping socio-spatial and visual relationships, using creation and imagination as a method and technique for overcoming differences and establishing new relationships.

Considering urban design as a creative, socio-spatial process, it is important to point out several interdependent dimensions in which it is created. Madanipour (1996) believes that, in the first place, it can be viewed as a space of imagination and creation for urban designers and architects, and in that sense, it manifests itself as a subjective-expressive process. In the context of the social production of space, it is more of an objective-rational or social-communicative process of establishing new spatial relations in space and its visual artefacts. Its third dimension takes place in the interdisciplinary communicative process as a field for consideration and communication of different professional views. Intertwining and networking of the mentioned process dimensions makes urban design an important element in the integration and communication of different ideas, interests, and needs in the process of urban regeneration.

As a subjectively-expressive or individually-expressive process, urban design emerges in the space of the imagination of architects and urban designers and is viewed in relation to art and artistic attitude, taste, and expression. The talent of experts, their education, the power of imagination, technical skills, experience, and a sense of spatial-visual relations are becoming the dominant factors in this process. This dimension of urban design can be purely artistic and utopian in its extreme. Here, it is possible to distance oneself from engaged art and view it as a process of creating aesthetic values through the harmonisation of compositional elements into a coherent whole.

In that sense, the art of architects and urban designers becomes the bearer of ambient values. The urban designer, as a builder of the architecture of hierarchical value factors, uses art as a unifying factor in the multidimensionality of urban space. Bazik (1996) writes about the knowledge-intuition interaction: "It is a common understanding that design, in general, is an intuitive decision-making process based on talent, imagination, experience and feeling, or skill. In contrast, the rational/scientific decision-making process is based on relevant facts and proven indicators, i.e., knowledge. A special quality is given by the knowledge-intuition relationship" (Bazik, 1996, p. 85). The artistic dimension of urban design best corresponds to the approaches to urban regeneration that Hall (2002) called The City Beautiful Movement, 1900-1945, and Cities of Imagination (1880-1887). Although the author connects them to a period in the past, these approaches are still present today, as artistic expressions and expressions of imagination in urban design. The artistic side of urban design relates to Forester's idea that design and art can give common meaning (Forester, 1989, p. 121) in a society with many different kinds of people.

The story of the plurality of interests and development paradigms positions urban design more as an objective-rational or social-communicative process. This dimension expands the domain of urban design from the individual-creative process of architects and urban designers, to a broader, socially engaged process. For the social-communicative process, the type of rationality favoured in a certain social context is important. As follows, urban design, at one extreme, is a process of positivist and technical production of space (such as in the functionalist approach), which is practised in the paradigms of public administration, economic planning, and sustainable development. Rational paradigms look at urban development from the outside or from top to bottom, and their values are universally defined. This approach would best fit Hall's categorization: Cities of towers, City of theory, City on a Highway (Hall, 2002).

On the other hand, urban design is a social-communicative, internal process that is practised through social communication, including, according to Lazarević (1988, p. 67), "social imagination". In this position, ambient values are built from the inside or from the bottom up. It encompasses the paradigms of social, communicative, environmental, and sustainable development. This position implies wide participation in the negotiation of environmental values.

The position of the research is that this type of negotiation should be understood conditionally and dynamically. This approach has its parallels in Hall's (2002) categories: Unpleasant city, City in the Garden, Regional city, The City of Sweat Equity.

The third dimension of urban design takes place in an interdisciplinary framework of different professional views, which is very important for the realization of the concept of sustainability and the integration of different development

sectors. In that sense, its role in achieving rationality through the argumentative approach of horizontal relations of experts is emphasised. The complexity of the urban environment is a field of interdisciplinary action in which environmental values are built on the foundations of art, socio-economic and technical-technological relations. Interdisciplinarity is a rationality that is broader than the subjective rationality of urban designers, but also narrower than social-communicative rationality. Here, it is important to outline the communicative dimension of the interdisciplinary process, which, unlike the social-communicative one, is more positivist than collaborative.

Authors Tošković and Petrić (2006) emphasise different theoretical orientations (dimensions) of urban design – functionalist, systemic, humanistic, and formalistic – which are mutually exclusive. The authors open up inspiring questions in the search for an integrative instrument of positive aspects of different orientations.

COMMUNICATION AND AESTHETIC DIMENSIONS OF URBAN DESIGN

Urban design as a communicative process

The social-communicative dimension of urban design has established its connection with urban planning. Urban planning, according to Bajić-Brković, is a "decision-making process" of urban development (Bajić-Brković, 1992). Agenda 21 characterizes this process as participatory and communicative. According to Agenda 21, urban planning is a socio-communicative, thus wide participatory, process of decision making (UN, 1992). The basic question is: what communication procedure is carried out in this design-planning process? From the point of view of Habermas' (1984) theory of communicative action and urban development paradigms, this section will talk about the results of different communication processes.

In relation to different planning paradigms, there is a dilemma about the role of urban design in the process-product relationship. This further raises the question of the relationship between the rationalist (positivist) and the collaborative paradigm. The determining factor in this dilemma is the process of rationality that is carried out in a social context, i.e., a favoured planning tradition. As a product, urban design treats space as a realization of rationality defined at higher structural levels through a top-down approach, while in process orientation, urban design is situated in the field of collaborative paradigm and implies a bottom-up approach. "The social and physical environment is produced and reproduced in the interaction of agencies and structures, objects and contexts" (Madanipour, 1996, p. 133). In that sense, this research believes that the process of urban design should be placed somewhere between Lindblom's (1959) incremental theory of "muddling through" and Simon's (in Lindblom, 1959) rationally comprehensive approach to development. The position of urban design varies according to the type of problems it faces. For simple problems, urban design is more in the first and second orders of design, while in managing wicked problems, urban design is in the third and fourth order of design: "The fourth order of design is the design of the environments and systems within which all the other orders of design exist. Understanding how these systems work, what core ideas hold them together, what ideas and values – that's a fourth order problem" (Buchanan, 2015).

Although seemingly opposed, both the rational and the collaborative urban paradigms are unique in their emancipatory spirit. They differ only in the procedures for achieving rationality. Paradigms can be considered through the communication outcomes and the type of social capital that the process produces. Vujošević (2002), thus, connects the types of rationality, development paradigm and planning theory. It is interesting to note that this author mentions the parallel existence of many rationalities, but singles out instrumental, limited instrumental, communication, limited communication, and other types of rationality (such as political, ecological, market, etc.) as important for the planning process.

Communication and limited communication rationalities are important for this research. According to Vujošević's (2002) categorization and according to Habermas' (1984) theory of communicative action, they are, at their paradigmatic core, based on the development of democracy and the self-realization of the individual through unfettered and open communication. Open communication has limitations in the distortions of the communicative process. According to Vujošević (2002), the focus of this paradigmatic core is on transactional planning, dialogic incrementalism, advocacy planning, question-planning, and collaborative planning.

The fundamental dilemma in this planning theory is the ethics of communication, that is, the formation of the intersubjectivity field and Habermas' (1984) decentralisation of the subject. According to Habermas (1988), the decentralisation of the subject implies the establishment of a field of intersubjectivity for a dialogically unrestrained process and communicative action. It implies that actors and subjects are emancipated individuals and groups. Emancipated individuals can create a field for ethical communication through an argumentative dialogue process.

In that sense, the research will consider the different communication strategies of Habermas' (1984) theory of communicative action and discuss the solutions that are generated in different communication procedures. The assumption is that the process of urban design should enable unfettered communication using its imaginative and artistic characteristics. Unrestrained communication leads to communicative action, described in Habermas' (2002) theory, and to developmental social capital, which is important for the protection, affirmation, and creation of environmental values in urban space.

Habermas (2002) defines different types of communication in relation to motives and outcomes. In general, they can be reduced to two types: strategic and communicative sharing. A speaker who uses a strategic communicative act is in a position of teleological action, through which he realises his interest or intention and programmes and directs his actions based on predicting the behaviour of actors in a given situation. At the heart of teleological action is classical game theory. It is based on using different kinds of power to

get information and keep it from other people involved in the communication process.

In normative action, according to Habermas (2002), the relations between the participants are determined by the existing social norms, and although it seems that this type of communicative act is consensual, it actually reproduces the existing systems and relations in a certain social group. The solutions achieved in this way reflect a well-coordinated way of solving problematic situations and may be inadequate in situations that require a more creative approach. "Observed from the point of view of sociologists, there is a continuity between mere factual relations of power and those relations of power that have turned into normative authority. But from the point of view of participants in communication, as long as their worlds are sufficiently networked, all imperatives, against the background of such an intersubjective common context of the world of life, are understood according to the pattern of normatively authorised requirements." (Habermas, 2002, p. 145).

Furthermore, dramaturgical action by Habermas (2002) can also be described as hidden and teleological. In this type, the actors are in a dynamic position in relation to the existing social circles: they are neither soloists nor belong to any of them. In the dramaturgical action, instead of spontaneous communication, the actors wear masks with which they hide their true intentions. This action has a latently strategic character, because it is not based on argumentative action. "This is how a speaker behaves, for example, when he wants to convince his audience of something, probably because he lacks convincing arguments in a given situation." (Habermas, 2002, p. 144).

Habermas (1984) advocates a communicative action in which the actors in the process want to understand the intentions of others in order to direct their engagement towards joint action. In this procedure, the outcome of the communicative process is a consensus-type agreement, generated by the participants. The precondition is that the actors are willing to come to a solution in an open way and through argumentation. Communicative action is based on quality argumentation and rationalisation of the situation, so the argumentation procedure is the backbone of this type. The difference between behaviour in a communication situation is determined by the ultimate initial intention: orientation towards success or realization of personal or group interest, or orientation towards understanding and agreement. In this sense, Habermas (1984) distinguishes between the sociability of strategic and communication action.

Creativity and imagination may foster open communication and transform the utopia of communicative action into an active vision of our deeds. Creativity in art should overcome current power relations in specific urban contexts in which weaker groups are unable to communicate their thoughts and opinions about place regeneration. Using artistic methods of communicating views, such as images, slogans, drawings, and sketches, provides a foundation for further dialogue and clarification. Putting disparate visions of the future into a unified whole is a further step in aesthetic contemplation. The initial process of invoking creativity in the urban design process is a powerful tool of empowerment, i.e., establishing places that are more power-to than power-over.

Urban design as a creative process

The creative process of urban design can be viewed from two angles. The first is described as a subjective-creative process of architects and urban designers. The second represents the social-cognitive process that is most often associated with the collaborative paradigm. The collaborative paradigm assumes that each individual is a bearer of creativity. This attitude is related to the concept of social knowledge and creativity, which is a product of the socio-communicative process. According to Prendeville and Koria (2022), this discourse of design is mostly related to a-priori emergent modes of design, where, in the author's opinion, integration of social creativity as an emergent mode of creativity, i.e., Buchanan's fourth order of design with normative modes of first and second order of design, is needed (Buchanan, 1992).

In that sense, social creativity is in the complexity of knowledge and experience that each individual brings with them. In relation to urban paradigms, this process is outside the space of public agencies and institutions. As such, it is formed through Healey's soft infrastructure of social arenas (Healey, 1997). Participants in the creative process are actors and stakeholders from the public, private, and civil sectors. During this process, an integrated space is created in which the conditions are set for the glocal place to come to life in a specific urban setting.

It is misleading to associate the creative process of urban design solely with the prevalent collaborative paradigm. Creativity can be achieved in the positivist process of objective knowledge, where the objective-rational procedure leads to new ways of solving existing problems. In this sense, it can be exclusively disciplinary or primarily interdisciplinary, and both are very important for sustainable urban regeneration. The collaborative paradigm in the creative process has its limitations related to the equal treatment of different views of reality. If we understand these different views of reality as a source of creativity, we can easily fall into the traps of Baudrillard's (2001, p. 184) "simulations" and "simulacra": "We now live in a minimum of real sociability and a maximum of simulation. The simulation neutralises the poles that regulated the perspective space of the real and the law, exhausting the potential energy that still nourished the space of the law and the social game strategy governs most of our exchanges".

Under the guise of the social game of creativity and sustainability, the research believes that these traps lead us into the labyrinths of perversion of objective reality. It is clear that in this case, sustainability is treated from an extremely egocentric position, which does not advocate smart growth and can absurdly lead to locally unsustainable solutions. As such, it is not in the line of Castells' creation of subjects, but in the manipulative creative process of the "postmodern game" (Harvey, 2007) in which certain interests are most often favoured. The functional classification of the game is stated by Baudrillard (2001) as follows: game as a crime; game as learning; game as catharsis; game as creativity, spontaneity, dream; sports; electronic games. "This atomistic manipulation inherent in games is no different

from computer-based forms of control in the process of work" (Baudrillard, 2001, p. 186).

Consequently, the research connects the creative process of urban design to both a positivist and a collaborative perspective. Together, they form an integrative and iterative creative process. This provides objective rationalisation and equally treats different dimensions of sustainability by directing and facilitating creativity towards finding new ways to achieve rational sustainability goals. In fact, the creativity of the process is inseparable from its communicative dimension and the communicative procedure that is favoured in the process. Thus, Landry (2005) believes that the challenge for creative initiatives is to establish narrative qualities in communication and to deepen the principles of symbolic communication. Without these principles and the combined action of narrative and symbolic creativity, creativity can only be a testing ground for "systemic and organised mobilisation of bias" (Vujošević and Petovar, 2006, p. 306). Also, one of the borderline assumptions of the collaborative paradigm, according to which each individual carries the same level of creativity, is debatable. The research claims that everyone who takes part in the creative process should contribute to finding new solutions based on how creative they are and how much knowledge and experience they have.

Therefore, in the creative process of urban design, the factors and carriers of the process should be considered. The bearers of the process are individuals who possess a high level of creativity, i.e., the ability to imagine, visualise, argue, and objectify; while the bearers of the process are individuals and actors who have an interest in participating in urban regeneration. As bearers, the research recognizes urban designers who, through their imagination, can see and combine areas of different paradigms while employing appropriate methodologies and approaches for guiding and facilitating the process. Here, it is essential to distinguish between creativity and art. Creativity in the process of urban design refers to a new way of solving complex problems, those that cannot be solved by established, routine procedures. This requires the participation of all actors and stakeholders in order to activate social knowledge. Open communication is the precondition for this activation, which could be achieved in the artistic and creative milieu. In this sense, art can contribute to the integration into the "new universality" that is accepted and understood by the participants in the process.

Artistic aspects of the creative process in connection to the difficulties of locating aesthetics in the contemporary view of art will be further discussed. Šuvaković (2006) views aesthetics in relation to two poles: the aestheticization of art and the avant-garde aestheticization of art. The first is related to art for the sake of art, while the second is related to the concepts of utopian translation of culture, society, and even nature into concepts and programmes (Šuvaković, 2006). According to this author, the first pole of aesthetics is seen through "beautiful art", implying universal standards and criteria of the beautiful. In that case, aesthetics is a science that, with its rules and protocols, establishes the presence of the beautiful, and it happens that in the postmodern it is re-examined through a relativizing attitude towards the world in general. It is important to emphasise that in the posthistory of aesthetics, aesthetics is not rejected, but it is shown that there are completely different theoretical options in the game, and that this game cannot be resolved in favour of one possibility (Šuvaković, 2006).

It is this "game of difference" in positioning postmodern aesthetics that is the basis for the author's view that the diversity in the level of creativity that individuals as talented artists possess is the reason why aesthetics itself cannot be drowned in the philosophy of art. "The continuation of the project of modernity" through the "new universality" is possible if aesthetics is respected as an independent scientific discipline. In this way, aesthetics becomes one of the carriers of emancipation of individuals and groups in the communication process, because, as Baudrillard (2001, p. 135) says: "Ethics is always resolved in aesthetics". In this sense, aesthetics has its protocols, which according to Šuvaković (2006) are classified into: (a) empirical aesthetics (in which the data of sensory cognition are studied); (b) aesthetics as epistemology (in which aesthetics studies the protocols of describing and interpreting sensory cognition); and (c) aesthetics as a cognitive science and philosophy (which studies the bearers of sensory cognition).

According to this author, the subject of aesthetics remains the study of beautiful, which can be discussed through mathematical models (proportions, relationships, symmetries), models of communication aesthetics (within the theory of communication text aesthetics), and models of semiotics (aesthetics of non-linguistic, artificial languages), which produce symbolism of meaning. Also, in order for the notion of beautiful to be interpreted in all its forms, according to Šuvaković (2006), it must be shaped in such a way that theoretical protocols of all sciences can be applied to it. This multidimensionality of the study of beauty elevates aesthetics above the game of postmodern relativity, allowing the study of beauty to continue in an integrative relationship according to many scientific procedures. Thus, Mako (2009, p. 44) believes: "Essentially, the aspect of duality in the aesthetic interpretation of the creative process, as well as the principles of aesthetic judgment as its consequences, points to the problem of objective recognition of values achieved through subjective creation." According to this author, the renunciation of universal aesthetic principles raises the question of the possibility of objective judgement of individual aesthetic values (Mako, 2009).

The multidimensionality of beauty and the integration of its interpretations according to the protocols of all sciences support the position of this research that the possibility of the truth of beauty becomes the basis for a new universality. It is created in the aesthetic communicative process of the bearers and factors of creativity in Habermas' field of intersubjectivity. Speaking about the relationship between art, aesthetics, and the communicative process, it is important to emphasise the importance of cognitive aesthetics. In that sense, Šuvaković's definition represents the relationship of the individual (a factor of creativity) towards "[...] the process of creating a work (conceiving, making, performing, writing, documenting), then the appearance (regardless of the individual) and the appearance (in relation to the individual) of the work of art, and the reception of the work

[...]" (Šuvaković, 2006, p. 165).

This is a key argument for the position of this research in the categorization of carriers and factors of creativity, i.e., which in the process of urban design, not everyone is equal in terms of creative contribution. On the other hand, everyone has the right to express their creativity by harmonising it with the aesthetic and holistic criteria of beauty. In that way, it is possible to bring relativized images of reality, the future, and even values and interests into a coherent relationship and artistic harmony. Additionally, the veracity of art in association with aesthetics as a scientific discipline enables the objectification of multiple rationalities and identities and their ethical integration where the artistic process of urban design encourages creativity and personal development. In such a space, a dialogue opens for a two-way exchange of knowledge, impressions, opinions, etc. and their objectification, which gives urban design the quality of integration.

CONCLUDING REMARKS – AESTHETICS OF COMMUNICATION IN THE INTEGRATIVENESS OF THE URBAN DESIGN PROCESS

In sustainable urban regeneration, the urban design process, through communicative consensus, combines a positivist, artistic, and communicative-collaborative approach in an open game of designing a common future. The first involves the research of past and present facts and conditions, as well as the valorisation of variant solutions through estimation and monitoring of their effects on the environment. Here, urban design is artistically engaged in a creative search for unifying, integral values, using imagination and incorporating the existing state of things to create new value. Collaborative communication relies on social knowledge, social imagination, and a sense of community, in order to enrich positivist knowledge and emancipate individuals and groups in the creative process of the game of open communication. Furthermore, the fourth order of design according to Buchanan (1992) is integrating previous orders into coherent design of symbols, products, and systems, so we can say sustainable (urban) environments.

In this way, art and creativity become integrative factors of conflicting interests and different views of reality, and they lead to the delineation of the image of a common future reality. This image is in a coherent relationship with local and global values because it enables the development of a glocal identity. Landry (2005) defines the concept of the "urban cycle of creativity" as a growing urban energy leading to urban revival, based on the flow of ideas, participation, gathering places, and the development of "civic creativity". Integral urban design should make this cycle possible and lead to Forester's (1989) common meaning, which brings together people with interests that seem to be at odds with each other.

As a result, aesthetics in communication becomes a key instrument for integration in the fourth order of design. Urban design in the fourth order is a process of empowering individuals and groups by evoking their creativity using design tools of the first order of design, like symbols, sketches, slogans, etc., to overcome barriers in communication, enabling the flow of ideas and thoughts. Here, urban design becomes Kant's "play of thoughts" (Derek Lomas and Xue, 2022) using overall aesthetic procedures of harmony, believing that dissonance and consonance contribute equally to integration. In this process, the game becomes a learning process of communication play instead of manipulation.

To construct a sufficiently complex and coherent common picture, players must engage in open play, that is, become active participants in the process of urban design. Urban designers stand out as bearers of creativity in the artistic dimension of the urban design process, directing and facilitating the communicative process of urban regeneration with a collaborative and instrumentally rational approach, relying on intuition, visualisation power, and creating a coherent composition. To make the image's parts fit together well in terms of size, proportion, colour, tone, light, and shadow, rationalisation is needed.

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REFERENCES

Bajić-Brković, M. (1992). *Predavanja iz urbanističkog i prostornog planiranja*. Beograd: Arhitektonski fakultet Univerziteta u Beogradu.

Baudrillard, J. (2001). *O zavođenju*. Podgorica: OKTOIH.

Bazik, D. (1996). Problemska orijentacija procesa oblikovanja gradskog prostora. In N. Lazarević-Bajec, M. Ralević (Eds.), *Strategija urbanizacije u uslovima neizvesnosti*. Beograd: Arhitektonski fakultet Univerziteta u Beogradu, pp. 83-118.

Buchanan, R. (1992). Wicked Problems in Design Thinking, *Design Issues*, Vol. 8, No. 2, pp. 5-21. https://doi.org/10.2307/1511637

Buchanan, R. (2015). *Four Orders of Design*. InovaGov [online]. https://redeinovagov.blogspot.com/2015/11/four-orders-of-design-richard-buchanan.html [Accessed: 1 Dec 2022]

Castells, M. (2000). *The Rise of the Network Society*. Oxford: Blackwell Publishing.

Castells, M. (2004). *The power of identity* (2nd ed.). Oxford: Blackwell Publishing Ltd.

Derek Lomas, J., Xue, H. (2022). Harmony in Design: A Synthesis of Literature from Classical Philosophy, *She Ji: The Journal of Design, Economics and Innovation, the Sciences, Economics, and Design*, pp. 65-92. https://doi.org/10.1016/j.sheji.2022.01.001

Dovey, K. (1999). *Framing Places: Mediating Power in Built Form*. New York: Routledge.

Forester, J. (1989). *Planning in the Face of Power*. London: University of California Press.

Habermas, J. (1984). *The Theory of Communicative Action – Volume One: Reason and the Rationalization of Society*. Boston: Beacon Press.

Habermas, J. (1988). *Filozofski diskurs moderne: Dvanaest predavanja*. Zagreb: Globus.

Habermas, J. (2002). *Postmetafizičko mišljenje.* Beograd: Čigoja štampa.

Hall, P. (2002). *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century*. Oxford:

Blackwell Publishing.

Harvey, D. (2007). *The Condition of Postmodernity*. Oxford: Blackwell Publishing.

Healey, P. (1997). *Collaborative Planning: Shaping Places in Fragmented Societies*. London: MACMILLAN PRESS.

ICOMOS – International Council of Monuments and Sites General Assembly (1972). *Resolutions of the International Symposium on the Conservation of Smaller Historic Town.* ICOMOS [online]. https://www.icomos.org/en/resources/charters-and-texts/180-articles-en-francais/chartes-et-normes/384-resolutions-of-the-international-symposium-on-the-conservation-of-smaller-historic-towns-at-the-4th-icomos-general-assembly [Accessed: 11 Jun 2010]

Kossoff, G. (2015). Holism and the Reconstitution of Everyday Life: a Framework for Transition to a Sustainable Society, *Design Philosophy Papers*, Vol. 13, No. 1, pp. 25-38.

Kossoff, G., Irwin, T., Willis, A. M. (2015). Transition Design, *Design Philosophy Papers*, Vol. 13, pp. 1-2. https://doi.org/10.1080/14487136.2015.1085681

Kossoff, G. (2019). Cosmopolitan Localism: The Planetary Networking of Everyday Life in Place, *Cuadernos Del Centro De Estudios De Diseño y Comunicación*, No. 73, pp. 51-66. https://doi.org/10.18682/CDC.VI73.1037.

Landry, C. (2005). *The Creative City: A Toolkit for Urban Innovators*. London: Earthscan.

Lazarević, N. (1988). *Grad između empirije i utopije*. Beograd: Istraživačko-izdavački centar SSO Srbije.

Lindblom, C. (1959). The Science of "Muddling Through", *Public Administration Review*, Vol. 19, No. 2, pp. 79-88.

Madanipour, A. (1996). *Design of Urban Space: An Inquiry into a Socio-spatial Process.* Baffins Lane, Chichester: John Wiley & Sons Ltd.

Mako, V. (2009). *Estetika-arhitektura. Knj.2, Kreativni proces između subjektivnog i opšte-društvenog estetskog značenja.* Beograd: Arhitektonski fakultet Univerziteta u Beogradu, ORION ART, Beograd.

Max-Neef, M. (2010). Development and human needs. In A. Lera St. Clair, D. Gasper (Eds.), *Development Ethics*. London: Routledge, pp. 197-214.

Mrđenović, T. (2011). *Urban regeneration of protected ambients in the context of sustainable development – Bač Fortress Suburbium*. Beograd: Univerzitet u Beogradu – Arhitektonski fakultet.

Mrđenović, T. (2013). Urban regeneration: Questioning the subject, *Technics Technologies Education Management –TTEM*, Vol. 8, No. 3, pp. 1350-1355.

Prendeville, S., Koria, M. (2022). Design Discourses of Transformation, *She Ji: The Journal of Design, Economics and Innovation,* Vol. 8, No. 1, pp. 65-92. https://doi.org/10.1016/j.sheji.2022.01.002

Reeves, D. (2005). *Planning for Diversity: Policy and Planning in a World of Difference*. New York: Routledge.

Šuvaković, M. (2006). *Diskurzivna analiza: prestup i/ili pristupi "diskurzivne analize" filozofije, poetici, estetici, teoriji i studijama umetnosti i kulture*. Beograd: Univerzitet umetnosti: Fakultet muzičke umetnosti.

Tošković, D., Petrić, J. (2006). Generating Aspects of Urban Design. In R. Bogdanović (Ed.), *Urbani dizajn.* Beograd: Društvo urbanista Beograda, pp. 11-22.

UN (1992). *Agenda 21*. www.un.org/esa/dsd/agenda21 [Accessed: 1 Dec 2022]

Vujošević, M. (2002). *Novije promene u teoriji i praksi planiranja na zapadu i njihove pouke za planiranje u Srbiji/Jugoslaviji*. Beograd: Institut za arhitekturu i urbanizam Srbije.

Vujošević, M., Petovar, K. (2006). Javni interes i strategije aktera u urbanističkom i prostornom planiranju, *Sociologija*, Vol. 48, No. 4, pp. 357-382. https://doi.org/10.2298/SOC0604356V

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EMPATHY WITH PLACE: UNDERSTANDING THE CONCEPT AND APPLICATION OF AN ARTISTIC RESEARCH APPROACH USING AI-BASED TOOLS

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Empathy – the projection of a subjective state into an object using one's imagination, so that the object appears to be infused with this state – can be experienced not only on an interpersonal level but also with animals, machines, ecosystems and places. The importance of empathy in design and other place-related practices is currently acknowledged by researchers and designers. The aim of this research was to develop a theory-grounded artistic research approach using Artificial Intelligence (AI) based tools in order to stimulate connection with a place and induce empathy with the place. The first section of the article presents a literature analysis and systematisation in connection with place, empathy, and human-place relationships. Selected theoretical landscape models are analysed in order to reveal the theoretical premises for human-place relationships involving empathy. The second section includes the presentation of the proposed methodology for artistic research, the application of the methodology in two historical localities for recreation (Panemune and Kulautuva) situated in and around the city of Kaunas (Lithuania), and an assessment of the results using an approach based on self-reflection and autoethnography. The research proves that it is possible to develop artworks using AI-based tools to create a connection between human beings, places and artificial intelligence. The creation of the artworks induced biophilic and topophilic reactions to the places chosen by the creators, as well as the experience of the genius loci and empathy with the places in which the artistic research was carried out.

***Key words*: empathy, place, artistic research, artificial intelligence.**

INTRODUCTION

This research is centred on two concepts – place and empathy – and their possible interconnections, as well as how these interconnections can be employed using hybrid science-art practice (Heras *et al*., 2021) for more meaningful and sustainable interactions of humans with a particular place. Place can be defined as a space that has meaning. Empathy in this research is approached as the projection of a subjective state into an object using one's imagination, so that the object appears to be infused with this state. The main research question of this study is: can an artistic research approach using Artificial Intelligence (AI) based tools stimulate the connection with a place and induce empathy with that place?

The importance of empathy in design (Mediastika, 2016), conservation (Sobel, 1996) and sustainability in general (Brown *et al*., 2019) is acknowledged by numerous researchers, who have raised questions regarding how it can be induced, stimulated and integrated into design and other place-related practices. According to Sliwinska (2019), in order "to design places of spiritual quality and depth, designers need to reconnect themselves to the nature of place in order to create a sense of belonging prior to presenting a design solution". Sliwinska (2019) proposes artistic practices for connection with places. Brown *et al*. (2019) distinguish the generative method in empathy research, which is action-oriented and collaborative, and

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aims to co-produce empathy-based strategies for positive change. Goralnik *et al*. (2017) speak of imagination encouraged through inquiry into arts and humanities, which might facilitate an effective understanding of social-ecological systems. Bearing in mind the importance of art in the process of giving and deriving meanings in the context of place, as distinguished by Tuan (1977), this research employs the method of artistic research.

The arts-based research or hybrid science-art practice (Heras *et al*., 2021) in this research also combines the autoethnographic (Ownby, 2013) method. According to Heras *et al*. (2021), numerous methods, practices, and experiences have recently emerged in the interface between arts and science, and the contribution of such hybrid approaches to sustainability research have started to be noticed with their unique methods, emphasis on trans-disciplinarity and stimulus to move towards societal transformations. As Heras *et al*. (2021) state, there are different assets of art-science practices, which include: embracing more than cognitive aspects of knowledge; changing relationships to nature; providing alternative explorative means for approaching reality; expanding the understanding of qualitative experience; embracing trans-disciplinarity, expanding conventional epistemologies towards practical, embodied, and emotional domains; and the generation of meanings. Therefore, all these aspects of hybrid approaches were found to be significant in the evaluation of this research outcome. Furthermore, the autoethnographic method, which can be referred to as an autobiographical genre of writing and research according to Ownby (2013), was also found beneficial to follow.

In that regard, this paper combines art (defined as the quality, production, expression, or realm, according to aesthetic principles, of what is beautiful, appealing, or of more than ordinary significance (Tromble, 2020)) and conventional research practices, such as a literature review, elaboration of a theoretical model and formulation of a system of criteria for verification of the research hypothesis. Therefore, it focuses on the theoretical conceptualisation of empathy with place, and the development and application of an artistic research approach using AI-based tools aimed at inducing empathy with the chosen places in the artwork creators.

The first section of the article presents a literature analysis and systematisation in connection with the place and human-place relationships. Then, the second section explains the artistic research approach based on empathy with place using AI-based tools. This section also includes the methodology of artistic research, the application of the methodology in two localities situated in and around the city of Kaunas (Lithuania), and the assessment of the results from the point of view of empathy with place using self-reflection and autoethnography (Ownby, 2013). In the course of this research, the authors primarily focused on artist-place interaction and the emergence and strengthening of empathy with the chosen places in the artwork creators during the artistic activities. Therefore, the investigation regarding the interaction between society and the artworks created in the artistic research process is envisioned as the future research direction.

THEORY

Place and empathy

It is common to distinguish between the concepts of space and place, maintaining that the concept of space is more abstract and generic, and the concept of place is more particular and laden with meanings. According to Tuan (1977), the difference between space and place is determined by the meaning that people give to a particular area. Thus, space can be described as a location which has no social connections for a human being, meanwhile, place is a location that can be described as a "location created by human experiences" (Selten and van der Zandt, 2012). This research deals with the concept of place – a space that has meaning. It is evident that the concept of place involves dimensions that are intangible and beyond visible. Moreover, Tuan (1977) notes that meanings can be given to a location or derived from it not only through direct personal experience through senses, but also in an indirect way through the mediation of symbols and arts. This notion is fundamental in this research, as it deals with the process and outcomes of artistic research and involves the notion of symbol.

The other central concept – empathy – raises definition and interpretation challenges when seen in the context of place. According to Harrelson (2020), it is "an everyday phenomenon but a definitional enigma". Harelson (2020) defines empathy as the phenomenon of interpersonal understanding. According to Tam (2013), empathy can be generally defined as the understanding and sharing of another person's emotional experience. However, contemporary research literature demonstrates that empathy is possible not only with non-human beings, for example, animals (Sobel, 1996; Tam, 2013), but also with ecosystems and nature in general (Tam, 2013; Brown *et al*., 2019), as well as with inanimate objects (Misselhorn, 2009). According to Goralnik *et al*. (2017), empathy is an ethically relevant quality that applies to human-nature relationships. As Tam (2013) states, empathy towards non-human beings can be induced, for example, participants in an experiment who had taken the perspective of a suffering whale demonstrated stronger compassion toward whales in general and an intention to protect them.

Moreover, Tam (2013) proposed the concept of dispositional empathy with nature, which refers to the dispositional tendency of people to understand and share the emotional experience of the natural world. According to Brown *et al*. (2019), empathy with nature is a person's capacity to share the emotional experience of the natural world. Brown *et al*. (2019) and Tam (2013) distinguish the cognitive and affective (emotional) components of empathy. According to Tam (2013), these components are inseparably interrelated. Emotional empathy relates to experiencing others' emotional responses; the cognitive component refers to the capacity to understand others' emotions (Brown *et al*., 2019). When dealing with empathy with ecosystems or inanimate objects, the imagination component of empathy becomes very important. According to the definition of empathy presented in the Merriam-Webster dictionary (2022a), it can be defined as "the imaginative projection of

a subjective state into an object so that the object appears to be infused with it". According to Misselhorn (2009), the imagination must somehow be involved in the emergence of empathy with inanimate objects. The cultural context and value systems play an important role in the presence of empathy with nature as well. Tam (2013) states that individuals who consider nature to be sentient have stronger dispositional empathy with nature; and anthropomorphism is associated with dispositional empathy with nature as well. According to Opotow (1996), the degree to which non-human animate and inanimate aspects of the natural world are included in the scope of justice has varied considerably over time, and between cultures and traditions. For example, many traditional cultures used to see plants as living and vibrant beings. Indigenous cultures used to recognise plants as active agents and intelligent beings (Kopnina, 2018). Contemporary ecocentric environmental ethics approaches, such as the deep ecology movement, recognise intrinsic value in the natural world, including plants, animals and non-biotic elements such as mountains and rivers. For example, the founder of the deep ecology movement, Naes, encouraged people "to think like a mountain" (Brown *et al*., 2019).

Empathy with nature is considered as relevant for conservation and ecologically responsible attitudes and behaviours (Tam, 2013; Beery *et al*., 2015; Goralnik *et al*., 2017; Brown *et al*., 2019). Sobel (1996) expressed the idea that empathy plays a primary role in conservation: "we must begin in empathy, by becoming the animals before we can save them". Brown *et al*. (2019) extend this viewpoint and argue that there is a relationship between empathy and sustainability. They also maintain that empathy is emplaced in space and time, and that the "relationship between empathy and sustainability is mediated by place and identity". Such an implication is essential for this research, as it demonstrates that an empathetic relationship with a place, which may contain natural as well as anthropogenic components, may lead to the sustainable treatment of that place. Furthermore, sustainable treatment of a place may involve not only nature conservation, but social, economic and cultural dimensions as well; thus, it is possible to hypothesise that design efforts stemming out of an empathetic relationship with a place would lead to more sustainable outcomes. In general, the connection between design and empathy is not a new topic, and it goes back to the 1990s (Leonard and Rayport, 1997), although empathic design and planning are usually considered as human-centred (Mattelmäki *et al*., 2014; Mediastika, 2016; Biloria, 2021). However, Van der Ryn (2013) presents an interpretation of empathic design involving empathy both for natural and human communities.

Models and concepts related to empathy with place

In order to better understand empathy with place, it is essential to analyse the components and dimensions of a place and the approaches towards human-place interactions. For example, according to Brown *et al*. (2019), all action situations are comprised of a biophysical context, attributes of the community and institutions. For the understanding of place, it is helpful to analyse existing theoretical models that include different dimensions: the people-landscape interaction model by Tress and Tress (2001), the Identerra Model (Roca and Roca, 2007, Oliveira *et al*., 2010, Roca, 2012) and Seamon's (2014) concept of place as a synergistic relationality and organised complexity. The Identerra model uses the concepts of spatial fixes and spatial flows to characterise a geographical area and states that territorial identities depend on the landscape and lifestyle-related features of the area. Landscape in this model consists of spatial fixes, defined as the sum of the permanently and temporarily rooted and anchored elements of natural heritage, population, economic heritage, and cultural heritage in a geographical area. Lifestyles here are the spatial flows of use and management of the spatial fixes. Lifestyles include activities, relations and meanings within territorial and functional networks and systems that determine the functioning of nature, society, the economy, and culture. The model distinguishes two aspects of territorial identity – objective and subjective. The objective aspects are visible and non-visible, material and non-material fixes and flows that are recordable and verifiable through data and/or images. The subjective territorial identity involves spatial fixes and flows that are reflected in the knowledge, attitudes and practice of the actors in environmental, social, economic and cultural change. Subjective identity can be lived and pretended according to this model thus, it can be analysed using two primary sets of spatial fixes and flows: those that are practised/experienced (in real life) and those that are claimed/sought (in mind) and can be assessed by means of participatory studies based on the collection of primary data and images. The Identerra Model allows integration of the deskwork and participatory research approaches and methods (Roca and Roca, 2007, Oliveira *et al*., 2010, Roca, 2012). It is evident that the Identerra Model includes both tangible and intangible aspects of place. The intangible dimension is also characteristic of the people-landscape interaction model by Tress and Tress (2001). Tress and Tress (2001) distinguished five dimensions of the transdisciplinary landscape concept: landscape as a spatial entity, landscape as a mental entity, landscape as a temporal dimension, landscape as a nexus of nature and culture, and landscape as a complex system. Landscape as a mental entity is related to the concept of a noosphere. The Merriam-Webster dictionary (2022b) defines the noosphere as the "sphere of human consciousness and mental activity, especially in regard to its influence on the biosphere and in relation to evolution". Tress and Tress (2001) see the noosphere as the third dimension of the landscape, equally as important as the biosphere and geosphere. To them, the noosphere is the mental space of people, structured by perception and adaptation. By means of the noosphere, human beings are able to perceive and influence the physical-material reality of the geosphere and biosphere. Both motivations and actions result from the noosphere.

As Seamon (2014) states, the concept of place can be envisioned as a synergistic relationality and organised complexity, which involves six place processes: interaction, identity, release, realisation, creation and intensification. Place interaction refers to regular actions, behaviours, situations, and events occurring in a place. Place identity relates to the process whereby people associate themselves with a place and take that place as a significant part of their

identity. Place release involves unexpected encounters and events in a place. According to Seamon (2014), "through unexpected experiences and surprises happening in the place, people are "released" more deeply into themselves". Place realisation refers to the tangible presence of a place – its particular physical environment together with human activities and meanings of the place that evoke a distinctive place ambience and character. Creating a place involves "concerned people responsible for a specific place drawing on their commitment to and empathetic knowledge of the place to envision and make creative shifts in policy, planning, and design to strengthen place interaction, identity, release, and realisation" (Seamon, 2014). Place intensification refers to the power of policy, design, and implementation to revitalise and strengthen a particular place. Seamon's (2014) approach demonstrates the role of creation and creativity in the development of a place.

All of the models analysed include intangible and subjective dimensions, where meanings, imagination and empathy can be attributed. According to Brown *et al*. (2019), the processes of generating meaning, emotional attachment and embodied engagement occur in particular environments. Symbols in particular, which can be identified in the environment, can facilitate and provide intermediate information units that allow mediation between individual and collective realms of psychology. A definition and explanation of the symbol used in the research is provided by the American Psychological Association (APA, 2022a): "symbol – any object, figure, or image that represents something else. A written or spoken word can be regarded as a particular kind of symbol. In literature and art, symbols are generally suggestive rather than explicit in their meaning. Carl Jung maintained that the symbols of religion, mythology, and art throw special light on the collective unconscious." Furthermore, according to Petrušonis (2010), the knowledge of a wider cultural context and cultural archetypes can help identify particular symbols in landscape architecture ensembles. As he states, undifferentiated perception of the whole during the evaluation act activates the decoding of visual language based on pre-reflexive perception; it is a process analogous to a riddle. In such conditions, the value of the object is revealed to the appraiser, not through a "logical" but through an "aesthetic" understanding.

The theoretical models analysed in this research make it possible to conceptualise and position empathy with a place. Below, several concepts are distinguished that are related to empathy with a place, and they can be used to explain and understand this phenomenon better. These concepts include biophilia, topophilia, and the spirit of the place or genius loci.

The biophilia hypothesis was developed in 1984 by Wilson, a biologist, naturalist and writer. According to this hypothesis, humans, throughout their evolution and history, were constantly surrounded by nature and were in constant contact with biodiversity, and thus evolved in such a way that permanent connectedness with nature became very important for healthy human physical and psychological development (Kellert and Wilson, 1993; Browning *et al*., 2014; Samalavičius, 2020). The biophilia hypothesis states that human beings have the innate genetically based inclination to affiliate with nature; consequently, the biological diversity, the diversity of relations to nature, and the diversity of landscape types are important for healthy human physical and psychological development (Ode *et al*., 2008; Beery *et al*., 2015). The biophilia hypothesis can be one of the explicators of empathy with animals and other non-human living organisms and with nature in general. Biophilia can be one of the components of empathetic involvement with a place, as contact with nature usually occurs in a specific location, although it mainly involves the biological and partially geological components of the place.

Biophilia is attributed to the category of biological environment preference theories (Ode *et al*., 2008); thus, it lacks a cultural component. According to Roca (2012), subjective territorial identity is related to topophilia – the affective bond between people and place, or setting, or affective human ties with the material environment (Tuan, 1990; Beery *et al*., 2015). The topophilia theory is attributed to the category of mixed environment preference theories (Ode *et al*., 2008), as it involves the natural and cultural components of a place – the biosphere, geosphere and noosphere according to Tress and Tress's (2001) model. Topophilia clearly involves the built environment, cultural continuity and heritage. According to Beery *et al*. (2015), topophilia allows for a hybridised explanation of human affiliation with the non-human world that includes both cultural learning and innate genetically based origins. According to Roca (2012), the sense of topophilia changes with the (dis)integration of places and regions in the context of a globalised economy and culture. Topophilia is presumed to be a vivid and personal experience involving the synesthetic tendency (commingling of sensory stimuli and the memory of place), environmental familiarity, cognitive challenge, and ecodiversity (Ogunseitan, 2005). These characteristics of topophilia, experienced as place-based human affiliation with non-human nature (Beery *et al*., 2015), are very favourable for the emergence and fostering of empathy with a place. Moreover, topophilia allows the posthuman dimension of exploration of empathy with a place as it goes beyond empathising with nature and allows consideration of the continuum between humans, nature, and technology (Harrison, 2013). For example, in the topophilia concept, architecture would not be necessarily seen as the opposite to nature.

The genius loci, or spirit of a place, is a relevant concept that involves human experiences, as well as the intangible dimension and its nexus with the tangible world (Vecco, 2019; Petrušonis, 2018a), and it can be defined as the symbolic potential and the mythical-symbolic essence (Petrušonis, 2018b) of a place. According to Sliwinska (2019), designers who want to heighten people's awareness of a place through their design must discover and explore the spirit of the place. Vecco (2019) proposed a three-fold process: rethink, protect and transmit the place and its spirit. According to her, this "threefold movement is not linear, and to be successful, it needs to be circular and incremental". Capturing and exploring this symbolic potential can play an important role in one's empathy with a place in the personal experience of any person regardless their profession. Therefore, symbols in the perception of the genius loci can

play a meditative role between individuals and collectivities.

Vecco (2020) distinguishes three different layers of genius loci as a meta-concept, where each layer brings a dimension of significance: the visible and tangible material layer; the invisible experience of the place created in the human mind; and the underlying processes of human and natural activity with all interrelations between them. These dimensions form a set of phenomena that can explain the intrinsic and extrinsic nature of genius loci (Vecco, 2020). A graphical theoretical model of genius loci was constructed by the authors based on the dimensions distinguished by Vecco (2020) (Figure 1). This model demonstrates the role of symbols in the perception of genius loci and their mediative role between individual and collective psychology realms.

of biophilia and topophilia. The collective dimension was linked with the underlying processes of human and natural activity, with all interactions between them (Vecco, 2020) and the subtler components of genius loci. The ideas of environmental ethics, especially the Deep Ecology current of thought initiated by Naes, also propose the approach of connecting individual-collective dimensions. Næss (1973) proposed the rejection of the man-in-environment image in favour of the relational, total-field image. Such an approach also focuses on the possibility of identifying the human ego with nature; thus, by identifying with nature, human beings can enlarge the boundaries of their Self beyond their skin and developing a larger ecological self. Self-realisation is thus the realisation of a wider ecological Self (Brennan and Lo, 2022).

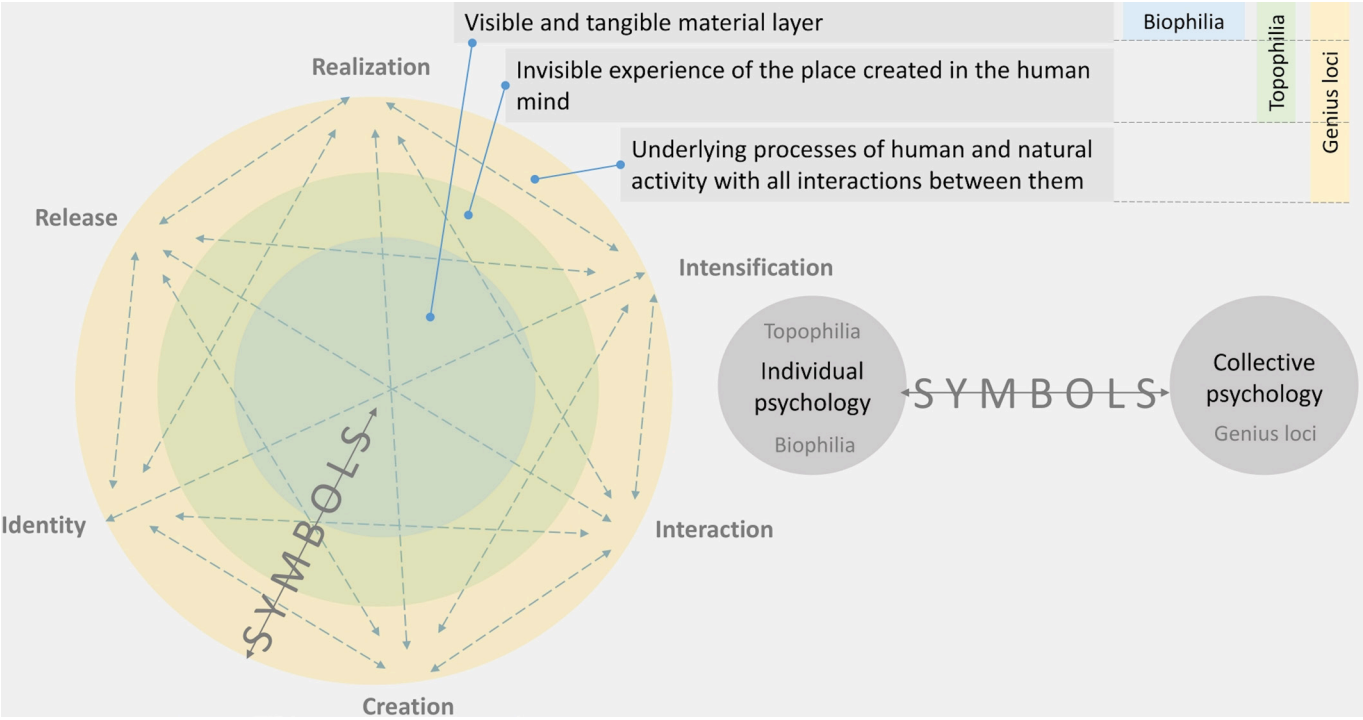

Figure 1. The theoretical model of genius loci drawn by the authors based on the dimensions distinguished by Vecco (2020), and the linkages and dynamics among the six place processes distinguished by Seamon (2014) demonstrate the role of symbols in the mediation between the realms of individual and collective psychology in the perception of place
(Source: Authors, 2022)

According to the American Psychological Association (APA, 2022b), "individual psychology underlines the uniqueness of individual development; however, individuals cannot be considered isolated from the wider social, cultural and ecological context". Collective psychology, according to the definition provided by American Psychological Association (APA, 2022c), is "the mental and emotional states and processes characteristic of individuals when aggregated in such groups as audiences, crowds, mobs, and social movements". However, deeper levels of collective human interconnectedness can be identified according to certain schools of psychology, for example, the collective unconscious in the Jungian school.

In the above-presented theoretical model, individual psychology was linked with the visual and tangible dimension of place, as well as with the experience of place in the human mind and consequently with the concepts

ARTISTIC RESEARCH APPROACH TOWARDS EMPATHY WITH PLACE USING AI-BASED TOOLS

In literature, new terms and concepts are currently emerging to identify mixed types of knowledge related with science-art practices, such as aesthetic understanding (Petrušonis, 2010), knowing through art (Johnson, 2010), and feelthink (Tromble, 2020). Tromble (2020) uses the term "feelthink" to name the shifting relationships of perception, emotion, thought, and action activated by artists working with interspecies communication (Tromble, 2020). This term can be applicable to this particular artistic research as well. The model of five levels of aesthetic perception presented by Dekay (2012) includes such phenomena as visual perception of form, present moment sensual experience, and knowledge and understanding in the process of aesthetic perception. Housen (1983) distinguishes intuition and interpretation in this process as well. Thus, artistic perception and creation

cannot be limited by spatiality and scientific knowledge. According to Heras *et al*. (2021), the notion of research through art emphasises the process of knowing as inquiry, in contrast with knowledge, which is a body of propositional statements. As such, art experiences constitute forms of knowing that include more-than-rational aspects such as creativity, imagination, emotions, motivations and values (Heras *et al*., 2021). Therefore, application of the artistic research approach to empathy towards a place can give valuable information regarding the perception of the place.

Research process and outcomes

The artistic research in Kaunas (Lithuania) was conducted in autumn 2021. However, the exhibitions took place in February 2022. The places which were the main locations of the research were the historic suburb of Kaunas Panemune and the historical recreational town of Kulautuva, located in the zone of influence of Kaunas. Both places used to be small settlements; however, they became resorts and had the most crucial part in their history around the interwar period in the 20th century. According to the Encyclopaedia of Lithuania and the world (2022), a tuberculosis sanatorium was opened in Kulautuva in 1931, and a tuberculosis sanatorium that specifically served for children started to operate in Panemune in 1933 (Migonyte, 2002). Furthermore, due to their connection with pine forests, water elements and nature, these districts became prominent because of their salutogenic features. Therefore, both of these locations have distinct characteristics which create the spirit of the place and have an impact on the way people experience them. In that regard, they were found notable as places to conduct artistic research on empathy with place. Furthermore, due to the strong community they have, these places are excellent models for investigating community involvement.

The first steps involved site visits and a literature review based on the history of the locations and historically significant events and objects. The historical analysis involved the search and collection of available archival material: historical photographs, drawings, and newspapers that could be used in the creative process. Therefore, it was possible for the authors to analyse the sensation of these places in the present day and understand their historical transformations. However, it is definitely not obligatory for every visitor to a place to research its archives. Archive searches have been proposed as one of the sources for the material for interpretation in artistic research. A rational approach as the chief source and test of knowledge (Blanshard, 2020) is important in gaining knowledge about the components of a place, and about the evolution and history of a locality. In the process of artistic research, the rationalist approach can be helpful in collecting historical material, and in selecting the most culturally, socially, and ecologically valuable artefacts for interpretation. However, artistic research in general, and this particular research, are not limited by reason, but include intuition, emotions, and the feelthink approach identified by Tromble (2020). The main research question asked was whether it is possible to integrate human experience with machine learning and empathy with a place and the spirit of that place, which can only be felt while at the location. In that regard, the site visits did not only help collect the materials needed, but at the same time, they provided experience of the place.

Furthermore, site visits made it possible to analyse the environment with regard to any symbols that may be present there. In the process of perception, one of the crucial aspects is the prior knowledge people have about the object they are observing and their general cultural grounding and experience. Therefore, the identification of symbols provides the required information for the observer, which then facilitates the process of connecting the object with prior knowledge and experience. During the site visits, both authors took photographs of the elements that caught their attention the most in the environment. These elements contained not only the general natural characteristics of the environment, but also the architectural objects and artefacts. In addition, small-scale formations – patterns – created by plants or animals were also the subject of the photographs. After collecting the material, the data was uploaded to use in the process of producing the digital art either as the background or as the style.

The second step of the research included selecting the patterns and the architectural objects or spaces from the photographs taken at the research locations. The composition of the artistic work was prepared by choosing the patterns from within a close radius around the space; therefore, the artwork can represent and reflect the proper sensation of the places. However, in the process of producing the artworks, other patterns drawn by one of the authors or retrieved from digital archives were used to add a layer of depth and artistic aspects to the pieces.

The next step in the process was to apply the AI-based tool to create the artworks. Digital art created by AI is one of the most trending art forms in the contemporary world of the digital age. However, the implementation of this approach has a long history that dates back to the 1970s (Grba, 2022). The use of AI establishes a stimulation for the artists to explore different perspectives; furthermore, it articulates new methodologies and an interdisciplinary approach to art. A technique commonly used in this process is Neural Style Transfer (NST), which gives the ability to create a stylised image by separating and combining the image in terms of its content and style (Cetinic and She, 2022).

In the overall process of creating the artworks, different algorithms and software can be used. The algorithms include the above-mentioned NST, Deep Dream, GAN, VQGAN+CLIP, and CLIP-Guided Diffusion. The algorithms applied in the generated art creation were comprehensively reviewed and discussed by Cetinic and She (2022). User-friendly AI-powered applications, such as Deep Dream Generator and Night Cafe Studio, can be used in the process of artistic research to facilitate the interaction of artists with the above-mentioned algorithms. Figure 2 demonstrates the artwork generation process and stages involving NST and VQGAN+CLIP. VQGAN+CLIP allows the generation of images from text or keywords; thus, place-related keywords or quotations can be used. Moreover, both photographs of the locality or archival material and the author's own artwork can be used either as a style or as the content of the artwork (Figure 2).

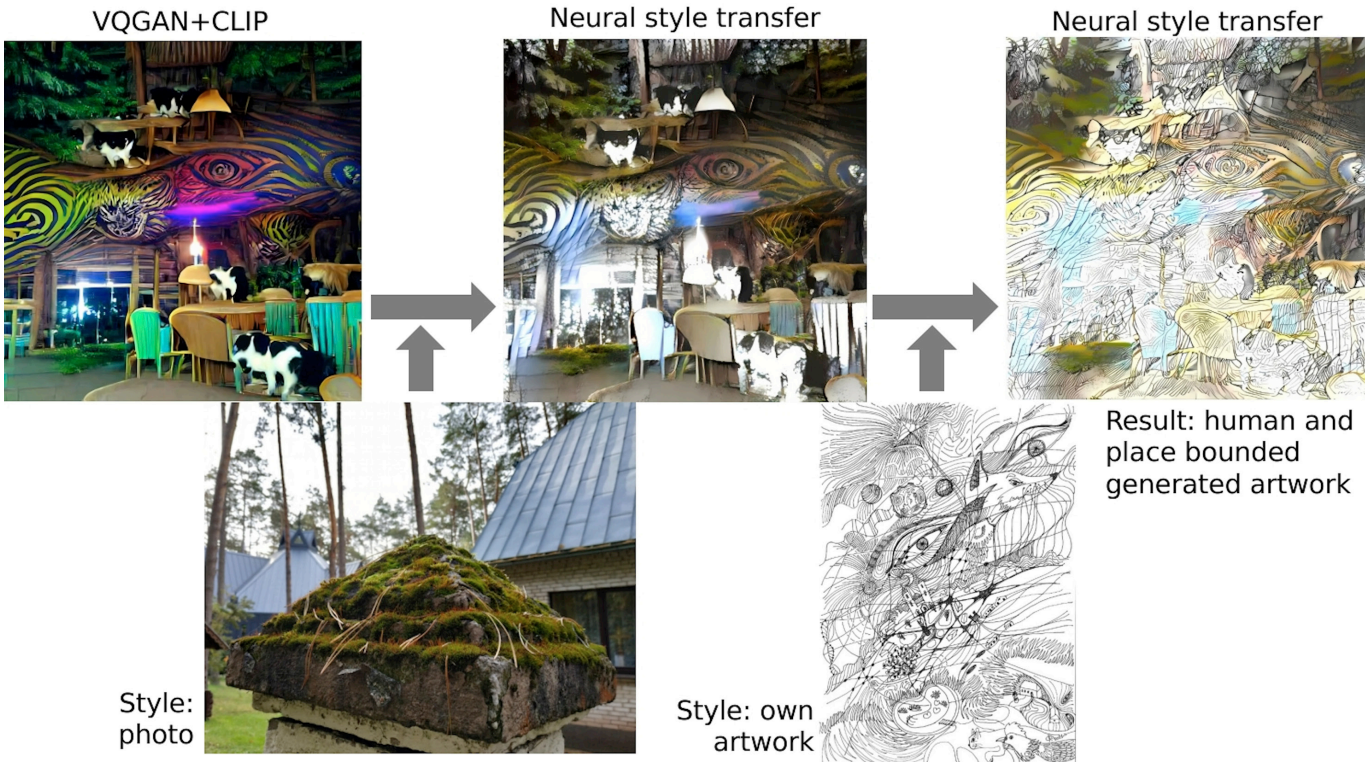

Figure 2. The generation process and stages of the artwork related to the locality of Kulautuva bearing the distinctive creative style of the author. Keywords characterising Kulautuva were applied using the VQGAN+CLIP algorithm, and photographs of the locality and the authors' own artwork were used as styles in NST. The result is original place-related generated artwork with sentimental value to its author. Artworks and photographs are by the authors. The Deep Dream Generator and Night Cafe Studio applications were used for generating the artwork.
(Source: Authors, 2022)

The last step of the process was the presentation of the artworks in exhibitions at the locations in Panemune and Kulautuva. The exhibition in Panemune was on February 26th, 2022 at a community centre, where the digital art objects were displayed on the walls of the main hall of the building (Figure 3).

On the other hand, even though the presentation of the exhibition and creative process in Kulautuva took place on February 27th, 2022 inside the hall of the leisure centre of the community, the objects were also installed in the park, which is at the centre of the settlement, in an outdoor exhibition. Therefore, the demonstration of the artwork was in a landscape context (Figure 4).

Evaluation of the outcomes of the artistic research

The dimensions for evaluating the artistic research outcomes were defined in the genius loci model presented in the theoretical section (Figure 1). Based on this model, the criteria for identifying the empathetic interaction with the place were elaborated (Figure 5). Finally, the outcomes of the artistic research were evaluated using an

Figure 3. Presentation of artworks and the creative process, and the exhibition in Panemune
(Source: Authors, 2022)

Figure 4. Exhibition in Kulautuva
(Source: Authors, 2022)

autoethnographic approach (Ownby, 2013) as a way of understanding qualitative experience (Heras *et al*., 2021) and the elaborated criteria. Figure 5 demonstrates that the hypothesis based on strengthening empathy with a place with the help of artistic interaction was confirmed. Reflections regarding the artistic research process, outcomes and benefits are presented below.

Connection with a place and identification of symbols

When people live in a particular place, occasionally, the environment can stay as a background for them rather than being the centre of their attention due to the hastiness of daily life. However, people are required to connect to a place to feel more comfortable in that environment. The environment people inhabit can be natural, urban, rural, or contain natural, rural, and urban features, but in every scenario, people are required to find a meaningful connection with it. Therefore, it is essential to establish an interaction with the environment or at least find a way to begin this relationship. According to De Botton (2006), what people search for in a work of architecture is not hugely different from what people search for in a friend. However, it can be said that it cannot be merely limited to architecture, but rather can be applied to all sorts of surroundings. Therefore, the ways in which communication with the environment can be started might have similar characteristics to starting communication with a friend, such as by spending more time with it, trying to create empathy, and focusing on and listening to it. Furthermore, identifying the symbols which help people to give meaning to a place can promote connection with it. Figure 6 presents the mind map of the places under consideration, constructed in the process of self-reflection. One of the ways which can contribute to achieving the connection is various forms of art. The artistic approach which was implemented in this research has the ability to move the focus and attention to the place, and at the same time, it can solidify the connection and induce empathy with the place.

Biophilic connection

The locations which were selected in this research have strong links with nature, which can be strengthened by the use of art. As stated by various researchers, nature has a restoring effect on people, which can contribute to both their physical and mental health (Ulrich, 1984; Ellard, 2015). Therefore, promoting this connection can be beneficial. Furthermore, it can consolidate the biophilic

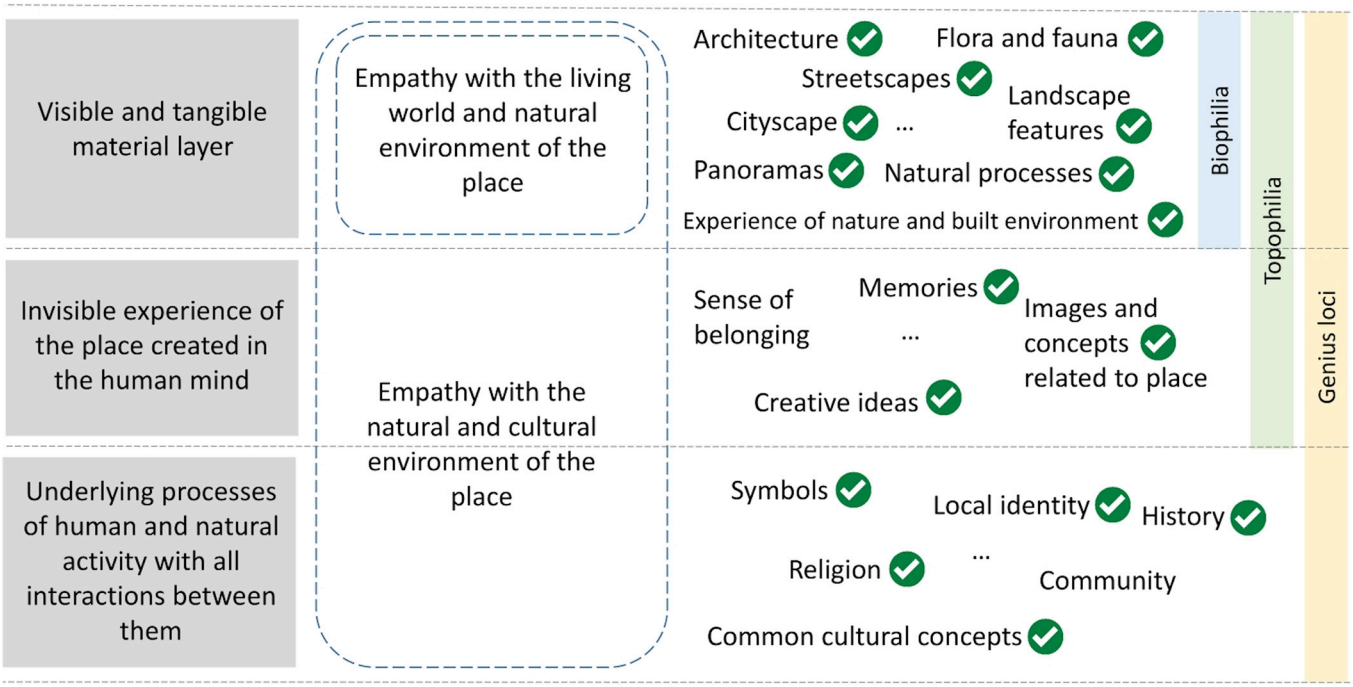

Figure 5. Structured assessment of the outcomes of the artistic research from the point of view of empathy of the artwork creators with the chosen places. The components of different layers of the places under consideration (the layers distinguished by Vecco (2020) are used) corresponding with biophilia, topophilia and genius loci are distinguished. The components identified and interpreted during the artistic research and which contribute to the formation and strengthening of empathy with the place are marked with green ticks.
(Source: Authors, 2022)

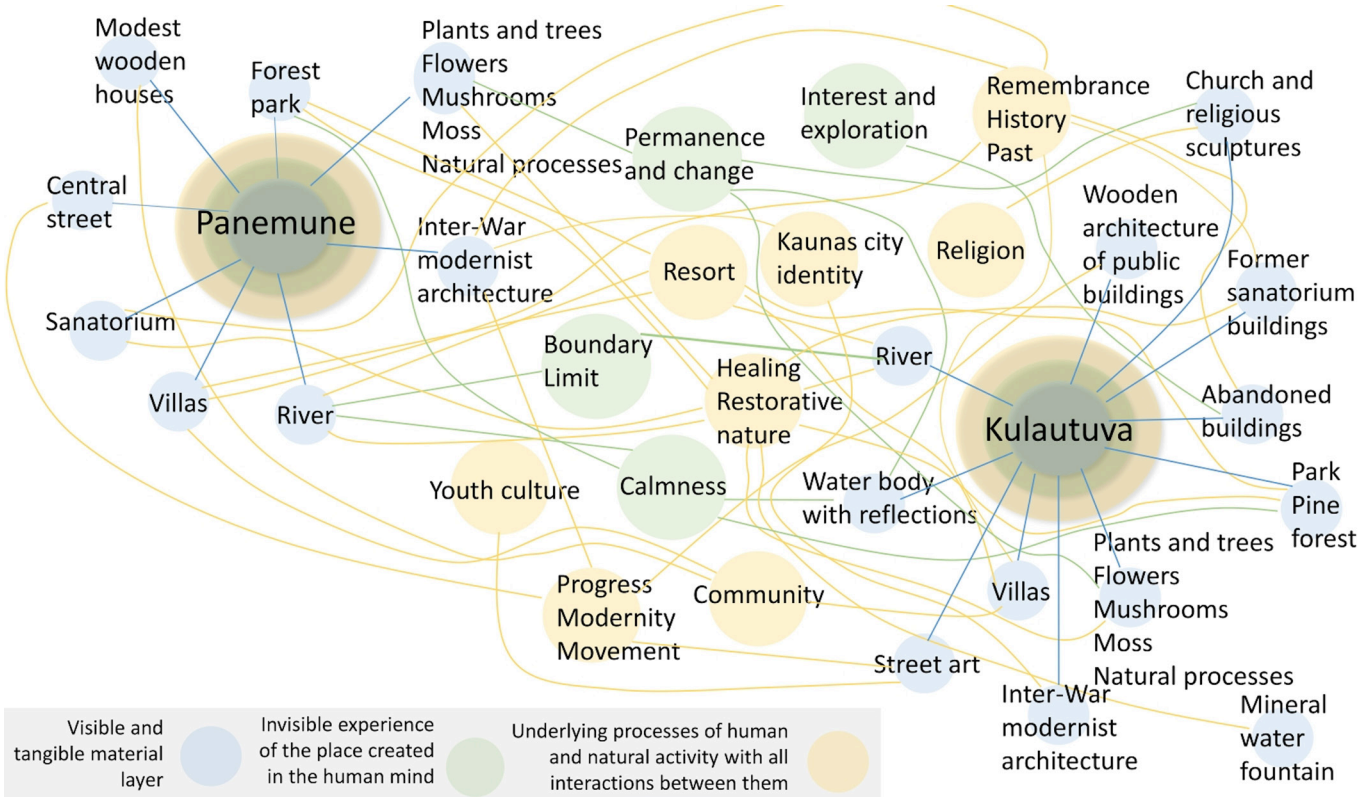

Figure 6. A mind map of different layers of the places under consideration (the layers distinguished by Vecco (2020) are used), and their tangible and intangible manifestations are compiled by the authors as a part of the reflection process. The attributes of the yellow layer can be attributed to the realm of symbols; this confirms the possibility of applying the artistic research approach presented to analysing and gaining a better understanding of the genius loci of a place.
(Source: Authors, 2022)

approach since it can encourage people to have a closer look at nature. In the course of creating the artworks, especially with NST, it was possible to collect the patterns locally, both in the natural environment and in the urban setting. The process of seeking the possible patterns and evaluating the surroundings with a different perspective can help explore the place in more detail, which would reinforce the connection. Furthermore, it can add a sentimental layer to the artwork since this would reflect the perception of a specific person.

Topophilic connection, genius loci, and interpretation

Additionally, as applied in the case of Kulautuva, the buildings or places used in the artwork can be selected from archival material and may not exist in the present. Therefore, this may need some research into archives or collections of historical documents. This process can help individuals associate themselves with a place more effectively, since it would contribute both to the topophilic approach and to understanding the genius loci. Buildings tend to reflect their distinct character on the environment, and they do help to provide a tangible connection to the past with their intangible elements. Both existing buildings and those which do not exist anymore are part of the collective memory of the inhabitants, and their relationship with the locality and the community can become the predominant image of the environment for them. Therefore, the architecture, landscape and environment can become a part of the memory of a place, and furthermore, they can help to establish new memories. In that regard, creating a solid connection with the environment, both with its present situation and its history, is crucial for societies. Indeed, engaging with art can help individuals to develop skills, which can give them the ability to express and reflect themselves in a way that can communicate with others. As stated by Eisner (2002), for social value to occur, two processes are needed. First of all, the material of memories and impressions needs to be treated with imagination; not only is recollection needed, but also "something of an invention". Second, the transformation of imagined material into some public form is needed – the contents of artistic consciousness need to be represented and made public (Eisner, 2002). The need of imagination, invention, and representation for the social value of art and can become a helpful tool in the realisation of human-place, individual-collective connections.

Connecting place, humans, and digital technology

On the other hand, one of the peculiar outcomes of this artistic research method is the fact that it adds another layer to the process, which is the impact of digital art. Digitalisation is one of the essential characteristics of the representation of art in the 21st century, and it contributes to both the physical and visual content of artworks. The transition of art into a virtual space helps to create a richer scope, but at the same time, it establishes the connection with the future. However, it might be possible to state that, due to the nature of digital art and artificial intelligence, it reveals the discussions regarding the human side of

technology and how it is connected both with emotions and places. Therefore, this research demonstrates that it is possible to create a work of art on digital platforms which connects human beings, places and artificial intelligence.

CONCLUSIONS

This research developed and applied a theory-grounded artistic research approach using AI-based tools in the historical localities of Panemune and Kulautuva to enhance connection with these places and induce empathy of the artwork creators with these places.

The theoretical grounding of the artistic research approach developed was provided by the analysis of landscape models, which have demonstrated the presence of intangible and subjective dimensions in the structure of landscapes and places, where meanings, imagination and empathy can be attributed. Furthermore, the concepts of biophilia, topophilia, and genius loci were distinguished as potentially explaining and helping people to understand empathy with a place.

The artistic research approach involved experiencing a place and interacting with it, applying artistic AI-based tools to generate artworks, and installing them in that place, accompanied by the continuous self-observation and self-reflection of the creators, which were essential for identifying biophilic and topophilic reactions to the place, as well as the experience of the genius loci and empathy. The research has confirmed the possibility of integrating the human experience of a place with AI, the spirit of the place and empathy with it. In this process human experience was integrated with AI-based tools, making it possible to create generative art forms. Art is a powerful tool on its own; it is the reflection of the ideas and the emotions of an individual. Furthermore, creating place-based art involves localized observations. Therefore, using both human experience and generative art contributed to empathy with the place for the authors, since the process of collecting data to feed the AI-tool helped to establish a connection with the place due to thorough and detailed observations. For establishing empathy, it is beneficial to spend more time in a place. Spending more time in a place not only helps one to engage with it as a space, but it also generates emotional bonds, which are further required for place attachment.

The assessment of the artistic research process and its results using self-reflection and autoethnography has demonstrated that the creation of artworks induced biophilic reactions (positive responses to the features of nature, affiliation with the nature in the locality), topophilic reactions (memories, personal images and concepts, creative ideas related to the place) to the places chosen by the artwork creators and experience of the genius loci (identifying symbols, common cultural concepts related with the place, sensing the distinctive identity of the place) of Panemune and Kulautuva. Consequently, all three layers of the genius loci of places, as distinguished by Vecco (2020), were involved in the artistic research process and outcomes. The application of an autoethnographic approach enabled the authors to conclude that they had experienced empathy with the places in which the artistic research was carried out. It can be assumed that the artworks installed in the landscape setting in the case of Kulautuva will have a continuous impact on the locality and community; therefore, the community response to the artwork-landscape connections can be a possibility for further study.

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REFERENCES

American Psychological Association (APA) (2022a). *Symbol*. APA Dictionary of Psychology [online]. https://dictionary.apa.org/symboly [Accessed: 24 May 2022].

American Psychological Association (APA) (2022b). *Individual psychology*. APA Dictionary of Psychology [online]. https://dictionary.apa.org/individual-psychology [Accessed: 24 May 2022].

American Psychological Association (APA) (2022c). *Collective psychology*. APA Dictionary of Psychology [online]. https://dictionary.apa.org/collective-psychology [Accessed: 24 May 2022].

Beery, T., Jönsson, K. I., Elmberg, J. (2015). From environmental connectedness to sustainable futures: Topophilia and human affiliation with nature, *Sustainability*, Vol. 7, No.7, pp. 8837-8854. https://doi.org/10.3390/su7078837

Biloria, N. (2021). From smart to empathic cities, *Frontiers of Architectural Research*, Vol. 10, No. 1, pp. 3-16. https://doi.org/10.1016/j.foar.2020.10.001

Blanshard, B. (2020). *Rationalism*. Encyclopedia Britannica [online]. https://www.britannica.com/topic/rationalism [Accessed: 19 May 2022].

Brennan, A., Lo, N. Y. S. (2022). *Environmental Ethics*. The Stanford Encyclopedia of Philosophy [online]. https://plato.stanford.edu/archives/sum2022/entries/ethics-environmental/ [Accessed: 24 May 2022].

Brown, K., Adger, W. N., Devine-Wright, P., Anderies, J. M., Barr, S., Bousquet, F., Quinn, T. (2019). Empathy, place and identity interactions for sustainability, *Global environmental change*, Vol. 56, pp. 11-17. https://doi.org/10.1016/j.gloenvcha.2019.03.003

Browning, W. D., Ryan, C. O., Clancy, J. O. (2014). *14 Patterns of biophilic design*. New York: Terrapin Bright Green Publishing.

Cetinic, E., She, J. (2022). Understanding and creating art with AI: Review and outlook, *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*, Vol.18, No. 2, pp. 1-22. https://doi.org/10.1145/3475799

De Botton, A. (2006). *The Architecture of Happiness*. London: Hamish Hamilton Publishing.

Dekay, M. (2012). Five Levels of Sustainable Design Aesthetics, *PLEA2012 - 28th Conference, Opportunities, Limits & Needs Towards an environmentally responsible architecture*. Lima, Perú 7-9 November 2012. http://plea-arch.org/ARCHIVE/websites/2012/

Eisner, E. W. (2002). *The arts and the creation of mind*. New Haven: Yale University Press.

Ellard, C. (2015). *Places of the heart: The psychogeography of everyday life*. New York: Bellevue Literary Press.

Encyclopedia of Lithuania and the world (2022). *Kulautuva Tuberculosis Hospital*. Kulautuvos tuberkuliozės ligoninė [online]. https://lietuvai.lt/wiki/Kulautuvos_tuberkulioz%C4%97s_ligonin%C4%97 [Accessed: 23 Mar 2022].

Ginzarly, M., Roders, A. P., Teller, J. (2019). Mapping historic urban landscape values through social media, *Journal of Cultural Heritage*, Vol. 36, pp. 1-11. https://doi.org/10.1016/j.culher.2018.10.002

Goralnik, L., Nelson, M. P., Gosnell, H., Leigh, M. B. (2017). Arts and humanities inquiry in the long-term ecological research network: Empathy, relationships, and interdisciplinary collaborations, *Journal of Environmental Studies and Sciences*, Vol. 7, No. 2, pp. 361-373. https://doi.org/10.1007/s13412-016-0415-4

Grba, D. (2022). Deep Else: A Critical Framework for AI Art, *Digital*, Vol. 2, No. 1, pp. 1-32.

Harrelson, K. (2020). Intention and empathy, *Philosophical Psychology*, Vol. 33, No. 8, pp. 1162-1184. https://doi.org/10.1080/09515089.2020.1822520

Harrison, A. L. (2013). *Architectural theories of the environment: Posthuman territory*. New York: Routledge Press.

Heras, M., Galafassi, D., Oteros-Rozas, E., Ravera, F., Berraquero-Díaz, L., Ruiz-Mallén, I. (2021). Realising potentials for arts-based sustainability science. *Sustainability Science*, Vol.16, No.6, pp.1875-1889.

Housen, A. (1983). *The Eye of the Beholder: Measuring aesthetic development*. (Doctoral dissertation, Harvard University, Ann Arbor: University Microfilms, Int.).

Johnson, M. (2010). Embodied knowing through art. In M. Biggs, H. Karlsson (Eds.), *The Routledge companion to research in the arts*, New York: Routledge Press, pp. 171-181.

Kellert, S. R., Wilson, E. O. (Eds.) (1993). *The biophilia hypothesis*. Washington, DC: Island Press.

Kopnina, H. (2019). Plastic flowers and mowed lawns: the exploration of everyday unsustainability, J*ournal of Urbanism: International Research on Placemaking and Urban Sustainability*, Vol. 12, No. 2, pp. 131-155. https://doi.org/10.1080/17549175.2018.1527780

Leonard, D., Rayport, J. F. (1997). Spark innovation through empathic design, *Harvard business review*, Vol. 75, pp. 102-115.

Mattelmäki, T., Vaajakallio, K., Koskinen, I. (2014). What happened to empathic design?, *Design issues*, Vol. 30, No.1, pp. 67-77.

Mediastika, C. E. (2016). Understanding empathic architecture, *Journal of architecture and Urbanism*, Vol. 40, No. 1, pp.1-2. https://doi.org/10.3846/20297955.2016.1165385

Merriam-Webster Dictionary (2022a). *Empathy*. [online]. https://www.merriam-webster.com/dictionary/empathy [Accessed: 23 Mar 2022].

Merriam-Webster Dictionary (2022b). *Noosphere*. [online]. https://www.merriam-webster.com/dictionary/noosphere [Accessed: 23 March 2022].

Migonytė, V. (2022) *Vanda Tumėnienė's private children's sanatorium in Jonas Basanavičius Park*. AUTC [online]. https://autc.lt/architekturos-objektas/?id=1447&rt=3 [Accessed: 28 Oct 2021].

Misselhorn, C. (2009). Empathy with inanimate objects and the uncanny valley, *Minds and Machines*, Vol.19, No.3, pp. 345-359. https://doi.org/10.1007/s11023-009-9158-2

Næss, A. (1973). The shallow and the deep, long-range ecology movement. *Inquiry*, Vol. 16, reprinted in Sessions 1995, pp. 151–155.

Ode, Å., Tveit, M. S., Fry, G. (2008). Capturing landscape visual character using indicators: touching base with landscape aesthetic theory, *Landscape research*, Vol. 33, No.1, pp. 89-117. https://doi.org/10.1080/01426390701773854

Oliveira, J., Roca, Z., Leitão, N. (2010). Territorial identity and development: From topophilia to terraphilia, *Land use policy*, Vol. 27, No. 3, pp. 801-814. https://doi.org/10.1016/j.landusepol.2009.10.014

Ogunseitan, O. A. (2005). Topophilia and the quality of life, *Environmental Health Perspectives*, Vol. 113, No. 2, pp. 143-148. https://doi.org/10.1289/ehp.7467

Opotow, S. (1996). Is justice finite? The case of environmental inclusion. In L. Montada, M. J. Lerner (Eds.), *Current Societal Concerns about Justice: Critical Issues in Social Justice*. Boston: Springer, Publishing, pp. 213-230.

Ownby, T. (2013). Critical visual methodology: Photographs and narrative text as a visual autoethnography. *Online Journal of Communication and Media Technologies*, Vol. 2, pp. 1-24.

Petrušonis, V. (2010). Role of cultural context in evaluating architectural complex. *Town Planning and Architecture*, Vol. 34, No. 5, pp. 252–261.

Petrušonis, V. (2018a). Symbolic potential of place and its modelling for management needs, *Landscape Architecture and Art*, Vol. 13, No. 13, pp. 39-48. https://doi.org/10.22616/j.landarchart.2018.13.04

Petrušonis, V. (2018b). Conditions for a dialogue of local community and genius loci, *Architecture and urban planning*, Vol. 1, pp. 70-74. https://doi.org/10.2478/aup-2018-0009

Roca, Z., de Nazaré Oliveira-Roca, M. (2007). Affirmation of territorial identity: A development policy issue, *Land use policy*, Vol. 24, No. 2, pp. 434-442. https://doi.org/10.1016/j.landusepol.2006.05.007

Roca, Z. (2012). *Territorial Identity and Regional Development Planning: The IDENTERRA Model*. Pdf Presentation in International Seminar on Strategic Planning Methods of Analysis of the Potential for Territorial Development, San Petersburg, Russia [online]. http://leontief-centre.ru/UserFiles/Files/ZRoca2.pdf [Accessed: 17 Feb 2022].

Samalavicius, A. (2020). Biophilic Architecture: Possibilities and Grinders, *Logos-Vilnius*, Vol. 105, pp. 109-118. https://doi.org/10.24101/logos.2020.79

Seamon, D. (2014). *Place as Organized Complexity: Understanding and making places holistically*. Unpublished Draft of Book chapter. Kansas, USA: Kansas State University.

Selten, M., van der Zandt, F. (2012). *Space vs. place*. MediaWiki [online]. http://geography.ruhosting.nl/geography/index.php?title=Space_vs._place&oldid=5653 [Accessed: 01 Mar

2022].

Sliwinska, M. J. (2019). The spirit of public space: embodied through writing and movement, *Journal of Interior Design*, Vol. 44, No. 1, pp. 13-27. https://doi.org/10.1111/joid.12142

Sobel, D. (1996). *Beyond ecophobia*. Great Barrington: Orion Society Press.

Tam, K. P. (2013). Dispositional empathy with nature, *Journal of environmental psychology*, Vol. 35, pp. 92-104. https://doi.org/10.1016/j.jenvp.2013.05.004

Tress, B., Tress, G. (2001). Capitalising on multiplicity: a transdisciplinary systems approach to landscape research, *Landscape and urban planning*, Vol. 57, No.3-4, pp. 143-157. https://doi.org/10.1016/S0169-2046(01)00200-6

Tromble, M. (2020). Ask not what AI can do for art... but what art can do for AI. *Artnodes*, Vol. 26, pp. 1-9.

Tuan, Y. F. (1977). *Space and place: The perspective of experience*. Minneapolis: University of Minnesota Press.

Tuan, Y. F. (1990). *Topophilia: A study of environmental perception, attitudes, and values*. New York: Columbia University Press.

Ulrich, R. S. (1984). View through a window may influence recovery from surgery, *Science*, Vol. 224, No. 4647, pp. 420-421.

Van der Ryn, S., Allen, F. (2013). *Design for an empathic world: Reconnecting people, nature, and self*. Washington, DC: Island Press.

Vecco, M. (2020). Genius loci as a meta-concept, *Journal of Cultural Heritage*, Vol. 41, pp. 225-231. https://doi.org/10.1016/j.culher.2019.07.001

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IN MEMORIAM

Dr Nada Milašin (1929-2022), through the prism of her work at the Institute of Architecture and Urban & Spatial Planning of Serbia

Dr Nada Milašin (maiden name Živković) was the only child of her parents, mother Evica and father Ljubomir and from her earliest childhood, Nada showed a desire for learning and knowledge – so her parents decided, which was very rare at that time, to send her to the grammar school in Prijedor after she had finished her primary education in Drvar in 1938 or 1939. At the beginning of the Second World War, in 1941, Nada found herself with her parents in Drvar and then, as a twelve-year-old, she was accepted into League of Communist Youth of Yugoslavia (SKOJ). During the Italian occupation, Nada and her mother were in prison in Knin from November 1942 to September 1943, i.e. until the capitulation of Italy. At the age of 14, Nada was the only young woman from Drvar sent to a coding course at the Supreme Headquarters of the People's Liberation Army. There were a total of 12 of them who attended that course, not far from the famous cave in Drvar. The head of the course was Branka Savić, the wife of professor and future academic Pavle Savić, who is assumed to have created the code, and the course itself took place in the greatest possible secrecy. This circumstance, i.e. the acquaintance with Pavle Savić, largely determined Nada's later orientation towards scientific and research work.

Nada survived Operation Drvar, a German operation in May and June 1944 whose goal was to capture Josip Broz Tito and remove the leadership of the Partisan movement in Yugoslavia. A few weeks after the operation, Nada, according to a previous command, joined the headquarters of the Fifth Corps as a code reader, where she carried out tasks from May to December 1944. In that period, as a code reader, not as a fighter with a rifle, she participated in the operations to liberate Banja Luka and Travnik, and in other actions of the Fifth Corps. Then a dispatch arrived from Belgrade, which was liberated in October 1944, that Nada should join the code department at the Supreme Headquarters. From the Supreme Headquarters, she was assigned to the Headquarters of the People's Defence Corps of Yugoslavia (KNOJ), where she worked as a code reader, including working in its counterintelligence service (KOS KNOJ), until demobilization in 1947. Then, Nada went to study in the Soviet Union at the Mendeleev University of Chemical Technology, but due to a resolution of the Informburo, she returned to Belgrade after a year, where she graduated from the Faculty of Technology. After completing her studies, she was employed at the Nuclear science Institute "Boris Kidrič" (present "Vinča" Nuclear Institute), where she continued her collaboration with Dr Pavle Savić. From 1964 until 1968, she stayed at the Saclay Nuclear Center in Paris, where she worked on the problem of the impact of radioactive radiation on the construction materials of nuclear reactors. She received her doctorate there in 1971 (doctorat ès sciences physiques) with very high marks, which are rarely obtained for a doctorate – très honorable. After that, Dr Nada Milašin returned to "Vinča", following which from 1976 to 1985, she was at the Federal Executive Council (SIV), as an advisor for environmental field. She jokingly said that since she had become involved in ecology, it was her "atonement" for her nuclear sins.

She was a doyen in the field of environmental protection in the SFRY (almost three decades of work in this field), where she worked as an advisor at the Federal Secretariat for the Protection of the Human Environment and a senior research associate at the Institute of Architecture and Urban & Spatial Planning of Serbia. She was one of the first proponents of developing Environmental Impact Analysis in SFRY. With her husband Marko, a diplomat and ambassador of the SFRY, she lived and worked in Hungary, France and a number of African countries (Algeria, Senegal and Gabon). Dr Nada Milašin taught at the École Nationale Polytechnique (Department Mines et Metallurgie), and at the University of Algiers as a nuclear physicist (1973-1975), as well as at the Faculty of Electrical Engineering in Belgrade (1962). Later, she taught in the field of environmental protection at the Faculty of Architecture in Belgrade (1994-1996), and worked in the Atomic-Biological-Chemical Administration of the SFRY.

In the early 1980s, the Institute of Architecture and Urban & Spatial Planning of Serbia endeavoured to improve its scientific research work and increase its scientific research staff. In that period, in addition to existing researchers at the Institute acquiring different scientific and research titles, the Institute took on a large number of researchers in the scientific profession, among them Dr Nada Milašin (1985).

Upon her arrival at the Institute, Dr Nada Milašin was immediately involved as an environmental associate in existing and new scientific research projects for the development of the Spatial Plan of the Republic of Serbia, as well as spatial plans for special purpose areas and some urban plans. My collaboration with her involved scientific research projects and spatial plans related to spatial development and environmental protection in large mining basins (Bor-Majdanpek, Kolubara, Kosovo-Metohija).

Nada Milašin (second on the left) attending the opening ceremony of the Belgrade Book Fair

During her time at the Institute, Dr Nada Milašin had certain responsibilities in the area of publishing. First of all, it should be noted that she was the first Editor-in-Chief of the international journal *Spatium*, from its launch in 1997 at the Institute of Architecture and Urban & Spatial

Planning of Serbia, until issue 19 from March 2009. For a time, she was president of the Institute's publishing council, and in this capacity, she prepared the presentation of the Institute's new publications at Belgrade Book Fair as part of the Ministry of Science stand. Nada and I (as the Director) attended the opening ceremony of the Belgrade Book Fair several times and participated in the presentation of the Institute's publications. Our joint photo is from one such ceremony (see the photo on a previous page).

During her work at the Institute, until her retirement (and after that) Dr Nada Milašin published a large number of scientific and professional papers, chapters in books, and she participated in numerous national and international scientific conferences.

It is little known that Nada Milašin also wrote poetry in here free time for her own enjoyment, poetry which was often humorous. She wrote children's poems (one book) as well as the books *Priručnik / The Guide* (1985), *Senegalski dani / Senegal days* (2008), and *Tuđe riječi i misli (Citati) / Other peole's words and thoughts (Quotations)* (2008). Nada wrote and published reportages from the countries in which she resided as a wife of a diplomat. She also translated from French to Serbian. Thus, Nada's translation of a poem (from 1982) was published in the journals *Šume* and *Drvotehnika* in articles by Slavka Zeković and Ratko Ristić respectively in 2016, as well as in an interview with Nada Milašin in *Drvotehnika* in 2017, and here it is in Serbian, with an abbreviated version in English:

Molitva šume (Translated from French by Nada Milašin)

Čoveče!

Ja sam toplota tvoga ognjišta u hladnim zimskim noćima.

Prijateljska hladovina kad sunce letnje žeže.

Ja sam sleme tvoje kuće, daska tvoga stola.

Ja sam ležaj na kome spavaš i drvo od koga brodove svoje gradiš.

Ja sam ručka tvoje motke i vratnica tvoga dvorišta.

Ja sam drvo tvoje kolevke i tvoga posmrtnog kovčega.

Čoveče!

Saslušaj moju molitvu:

Pusti me da živim i da smirujem klimu da bi ti se rascvetalo cveće.

Pusti me da živim i zadržavam tajfune, da zaustavljam peščane oluje.

Pusti me da živim da obuzdavam vetrove i oblake, da svetu nosim kišu.

Pusti me da živim da bih sprečila poplave.

Ja sam majka svih reka jer su potoci moja deca.

Ja sam bogastvo Zajednice jer su sela sa mnom imućnija.

Ja ukrašavam tvoju zemlju svojom zelenom odećom.

Čoveče!

Ja sam duša tvoje domovine.

Usliši moju molitvu:

Ne uništavaj me!

Prayer of the Woods (an abbreviated version)

I am the heat of your hearth on the cold winter nights,

the friendly shade screening you from the summer sun,
and my fruits are refreshing draughts quenching your thirst as you journey on.

I am the beam that holds your house, the board of your table,
the bed on which you lie, and the timber that builds your boat.
I am the handle of your hoe, the door of your homestead,
the wood of your cradle, and the shell of your coffin.
I am the bread of kindness and the flower of beauty.
Ye who pass by, listen to my prayer: Harm me not.

Dr Nenad Spasić,
Architect

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