URBANI IZZIV

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Revija *Urbani izziv* je namenjena razširjanju znanstvenih in strokovnih dognanj ter obravnavi problemov urejanja prostora. Na leto izideta dve številki. Prva številka izide junija, druga decembra. *Urbani izziv* se vsebinsko deli na dva dela. Prvi (daljši) del se imenuje »Članki«. V njem so objavljeni izvirni in pregledni znanstveni članki, kratki znanstveni prispevki in strokovni članki. Članki, ki so objavljeni v tem delu revije, so recenzirani. Drugi (krajši) del se imenuje »Predstavitve in informacije« in je namenjen objavi recenzij, predstavitvam (na primer knjig, projektov, dogodkov, predavanj, konferenc in podobno), knjižničnim informacijam in podobno. Prispevki, ki so objavljeni v tem delu revije, niso recenzirani. *Urbani izziv* je dvojezična revija – vsi prispevki so objavljeni v slovenskem in angleškem jeziku. Povzetki in polna besedila člankov so vključeni v slovensko podatkovno zbirko COBISS in slovensko digitalno knjižnico dLib.si ter v mednarodne bibliografske baze SCOPUS Elsevier, ERIH PLUS, EBSCOhost (Art & Architecture Complete, Academic Search Complete), ESCI (Clarivate Analytics), ProQuest (ProQuest Central), CEEOL (Central and Eastern European Online Library), IBSS (International Bibliography of Social Sciences), IBZ (International Bibliography of Periodical Literature in the Humanities and Social Sciences), GEODOK (Geographic Literature Database), EZB (Electronic Journals Library), CGP (Current Geographical Publications), ICONDA (International Construction Database), DOAJ (Directory of Open Access Journals), OCLC (Online Computer Library Center), Ulrich's Periodicals Directory, Academic Journals Database, Sciencegate, Index Copernicus International, J-Gate in Genamics JournalSeek. Revija je vpisana v razvid medijev, ki ga vodi Ministrstvo za kulturo Republike Slovenije, pod zaporedno številko 595. Revija izhaja s podporo Javne agencije za raziskovalno dejavnost Republike Slovenije.

Urbani izziv ("Urban Challenge") is intended for the dissemination of research and technical information as well as the discussion of issues relating to spatial planning. The journal is published twice a year. The first issue is published in June, and the second in December. *Urbani izziv* is divided into two parts. The first (longer) part is titled "Articles" and includes original research, review articles, short studies and technical studies. Articles in this part of the journal are subject to blind peer review. The second (shorter) part of the journal is titled "Reviews and information" and contains reviews, announcements (e.g., announcements of books, projects, events, lectures, conferences, etc.), library information and other material. The material published in this part of the journal is not peer-reviewed. The journal is published in two languages: all contributions are published in Slovenian and English. Abstracts and full texts of articles are included in the Slovenian COBISS database and the Digital Library of Slovenia (dLib.si), as well as in the international bibliographic databases SCOPUS Elsevier, ERIH PLUS, EBSCOhost (Art & Architecture Complete, Academic Search Complete), ESCI (Clarivate Analytics), ProQuest (ProQuest Central), CEEOL (Central and Eastern European Online Library), IBSS (Intenational Bibliography of Social Sciences), IBZ (International Bibliography of Periodical Literature in the Humanities and Social Sciences), GEODOK (Geographic Literature Database), EZB (Electronic Journals Library), CGP (Current Geographical Publications), ICONDA (International Construction Database), DOAJ (Directory of Open Access Journals), OCLC (Online Computer Library Center), Ulrich's Periodicals Directory, Academic Journals Database, Sciencegate, Index Copernicus International, J-Gate and Genamics JournalSeek. *Urbani izziv* is registered in the media register kept by the Ministry of Culture of the Republic of Slovenia under serial number 595. The journal is subsidised by the Slovenian Research Agency.

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Kakovost življenja v danih razmerah

Zima ima poleg snega in otroškega veselja tudi manj lepe strani. Zlasti tistim, ki živijo v zahtevnih razmerah, je zagotavljanje varnega in toplega življenjskega okolja prednostna skrb. Šele, ko zadovoljimo osnovne potrebe, namreč pridejo na vrsto kompleksnejše in manj nujne potrebe in želje, kot je želja po udobju in lepem bivalnem okolju.

Raziskava o zaznani kakovosti življenja v različnih tipih stanovanjske gradnje, ki jo predstavlja članek* v tokratni številki, je z vidika urbanističnega načrtovanja in sorodnih ved precej običajna raziskovalna tematika. Zaradi prostorskega konteksta – proučevane soseske so namreč v Kijevu – pa se nam kot bralcem, ki dogajanje spremljamo le v dnevnih medijih, v prvem trenutku morda zazdi, da vprašanje o kakovosti življenja ne spada v ta čas. Avtorji so ugotovili, da je navedena raziskava zaznavanja kakovosti prostora sosesk še posebej aktualna tudi z vidika obnove ukrajinskih mest po vojni. Ali bo ta temeljila na kaotičnih neoliberalnih posegih in koristih investitorjev ali bo upoštevala strokovna dognanja in bo temeljila na predhodnih raziskavah in dobro premišljenem in celostnem načrtovanju? Upamo na dober razplet in veseli bomo prihodnjih člankov na temo uspešne obnove.

Damjana Gantar, glavna urednica

* Glej članek Dronova, O., Khomenko, D., Brunn, S. D., objavljen v tej številki *Urbanega izziva*.

Quality of life under current circumstances

In addition to snow and the joy it brings to children, there are also some downsides to winter. Providing a safe and warm living environment is a primary concern, especially for those living in harsh conditions. It is only when we satisfy our basic needs that more complex and less vital needs and desires, such as the desire for comfort and an attractive living environment, come to the fore.

Perceived quality of life in various types of residential neighbourhoods, as explored in one of the articles* featured in this issue, is a fairly common research topic in urban planning and similar disciplines. However, because of the specific spatial context discussed (i.e., Kyiv), at first glance the issue of quality of life may not seem appropriate under current circumstances to us as readers, who only follow the latest developments in the daily media. The authors conclude that the study of quality of life in Kyiv neighbourhoods is especially topical in terms of rebuilding Ukrainian cities after the war is over. Will this rebuilding be based on chaotic neoliberal interventions and the interests of developers, or will it take into account previous research and rely on well-thought-out and comprehensive planning? We hope for a good outcome, and we look forward to future reports on successful renewal.

Damjana Gantar, Editor-in-Chief

*See the article by Dronova, Khomenko, and Brunn in this issue.

Aslı ULUBAŞ HAMURCU

Metavesolje, spletne skupnosti in (resnični) mestni prostor

Pandemija covida-19 je pospešila tehnološki razvoj in naložbe v tehnologijo, na podlagi česar se je oblikoval alternativni svet, ki omogoča izvajanje raznih aktivnosti in doživljanje raznovrstnih izkušenj na spletu. V ospredje prihaja pojem metavesolja, ki omogoča hkratno doživljanje resničnih in virtualnih izkušenj, ne glede na čas in prostor, v katerem je uporabnik, ter deluje kot posrednik in sredstvo, ki združuje resnično in virtualno okolje. Avtorica na podlagi sinteze in prilagoditve teorije družbeno-prostorske dialektike obravnava možne vplive razvoja metavesolja na (resnični) mestni prostor. Poda splošno oceno družbeno-prostorskih vplivov metavesolja in odpre prostor razpravi o tem vprašanju. Na podlagi pregleda literature ugotavlja, da naj bi tehnološki dosežki, kot je metavesolje, preuredili fizične in virtualne družbeno-prostorske odnose, z njihovo uporabo pa naj bi se oblikovale tudi nove družbeno-tehnološke skupine.

Ključne besede: metavesolje, spletne skupnosti, mestni prostor, figitalno, pandemija covida-19

1   Uvod

Pandemija covida-19 je pospešila tehnološki razvoj in naložbe v tehnologijo, na podlagi česar se je oblikoval alternativni svet, ki omogoča izvajanje raznih aktivnosti in doživljanje raznovrstnih izkušenj na spletu. Glavni razlog za večji tehnološki razvoj in večje naložbe v tehnologijo je potreba po preprečevanju motenj v procesih zaradi omejitev, uvedenih med pandemijo, ki so ljudem preprečevale uporabo fizičnega okolja ali (resničnega) mestnega prostora (tj. delovnih in javnih prostorov, trgovskih območij, zelenih površin, prostorov, namenjenih zabavi in razvedrilu, itd.) (Lim idr., 2022). Po drugi strani so že takrat delovale številne platforme in aplikacije, ki uporabnikom omogočajo virtualno doživljanje krajev z uporabo očal in slušalk za zaznavanje virtualne resničnosti (ki jim dajejo občutek, kot da so na dejanskem kraju) ali računalniških zaslonov (ki omogočajo samo gledanje). Za sporazumevanje in vsakdanje aktivnosti se uporabljajo spletne platforme (npr. Facebook in podobna družbena omrežja), aplikacije (npr. Zoom, WhatsApp in Messenger) in orodja (npr. računalniki in mobilni telefoni), čeprav je komunikacija omejena na pošiljanje sporočil, govorjenje in videokonference.

Tradicionalna komunikacijska sredstva imajo tehnične in fizične omejitve, ki so uporabnikom med pandemijo povzročale težave (glej tudi Wiederhold, 2020). V nasprotju z njimi metavesolje omogoča sočasno doživljanje resničnih in virtualnih izkušenj, ne glede na čas in prostor, v katerem je uporabnik, ter deluje kot posrednik in sredstvo, ki združuje resnično in virtualno okolje. V primerjavi s tradicionalnimi načini sporazumevanja v metavesolju uporabnik ne izgubi koncentracije in motivacije pri izvajanju aktivnosti ali opravil zaradi izgube prostorske referenčne točke (za pregled pomena prostorskih referenčnih točk glej Moser idr., 2015). Kot navajata Riva in Wiederholdova (2022), daje metavesolje uporabnikom občutek, kot da so dejansko prisotni na nekem kraju. Poleg tega lahko uporabniki ustvarijo navidezni svet, ki njim in drugim omogoča, da so del izkušnje ali da jo ustvarijo skupaj. Ker se ta izkušnja aktualizira v realnem času, se uporabnik izogne tehničnim omejitvam, značilnim za tradicionalne načine sporazumevanja. V metavesolju se torej od uporabnikov pričakuje, da se sporazumevajo z uporabo fizičnih in virtualnih sredstev v virtualnih okoljih in brez težav, s katerimi se srečujejo pri uporabi tradicionalnih komunikacijskih sredstev.

Izraz *metavesolje* (ang. *metaverse*) je leta 2021 začelo uporabljati podjetje Meta Platforms, beseda pa se je prvič pojavila v znanstvenofantastičnem romanu *Snow Crash* avtorja Neala Stephensona iz leta 1992. V njem se glavni junak giblje med dvema svetovoma – med distopično različico Los Angelesa in virtualnim svetom, imenovanim *metavesolje* (Kirtley, 2021) –, internet pa se razvije v obliko, ki temelji na navidezni resnič-

nosti, pri tem ljudje na internetu s svojimi digitalnimi avatarji raziskujejo omenjeni navidezni svet, da bi pobegnili pred distopično resničnostjo svojega življenja (Arapkirli, 2021). Nekateri metavesolje poimenujejo tudi internet naslednje generacije (Cheng idr., 2022). Prvi splošno sprejeti prototip metavesolja je bil predstavljen že konec sedemdesetih let 20. stoletja v obliki interaktivne besedilne igre za več igralcev, imenovane MUD (ang. *multi-user dungeon*) (Cheng idr., 2022). Z napredkom tehnologije in interneta je sledil razvoj komercialnih virtualnih svetov (npr. Second Life, tridimenzionalni virtualni svet, v katerem se uporabniki sporazumevajo v realnem času in sami oblikujejo vsebino) (Second Life, 2022a) in odprtokodnih platform, kot je OpenSimulator, v/na katerih gostujejo omenjeni tridimenzionalni virtualni svetovi. Današnje metavesolje se od prvotnih različic razlikuje po tem, da lahko do njega kadarkoli in kjerkoli zlahka dostopamo prek mobilnih naprav ali po katerih drugih digitalnih poteh (S.-M. Park in Kim, 2022) ter da ga lahko razvija vsakdo, ki ima dostop do interneta in potrebno znanje. Na splošno lahko današnje metavesolje opredelimo kot vmesnik, ki ponuja dostop do virtualnih svetovov s spletno povezavo ali brez nje (van der Merwe, 2021).

V zadnjem času se metavesolje v razpravah obravnava kot sredstvo, ki omogoča izmenjavo interesov in družbene stike, pri katerih je poudarek na vsebini (S.-M. Park in Kim, 2022: 4211), vse skupaj pa naj bi bilo podprto s tehnologijo 5G in t. i. mobilnimi tehnologijami za potopitveno izkušnjo (ang. *mobile immersive computing*) (Cheng idr., 2022). Tehnologija 5G naj bi zanesljivo in brez zamikov povezala stvari kjer koli na svetu, tako da jih bodo lahko ljudje merili, razumeli in urejali v realnem času. Na milijarde povezanih naprav (internet stvari) bo zbiralo in si izmenjavalo podatke v realnem času, na podlagi česar se bodo reševale težave, povezane z vsakdanjimi aktivnostmi in opravili (Ericson, 2022). Poleg tega naj bi s tehnologijo 5G metavesolje še bolj zaživelo, saj rešitve 5G zagotavljajo infrastrukturo, ki jo mobilne tehnologije za potopitveno izkušnjo potrebujejo za upravljanje pretoka podatkov, ki jih pridobivajo. Oblikovanih naj bi bilo celo več različic metavesolja, podobno kot pri uvedbi interneta (Haber Global, 2022). Cheng idr. (2022) opisane procese opredeljujejo kot odprto fazo razvoja metavesolja.

Omenjena faza je v polnem zagonu. Nekatera podjetja, med njimi Microsoft, Roblox in Epic, že vlagajo v razvoj svojih različic metavesolja, pri čemer uporabljajo napredne tehnologije, kot so 5G, umetna inteligenca, robno računalništvo in računalništvo v oblaku (Clement, 2022). Medtem se (resnični) mestni prostor v metavesolju reproducira v digitalni obliki (kot digitalni dvojček) (za več informacij o metamestih, ki so virtualne kopije obstoječih (resničnih) mest, glej Wang et al., 2022), da lahko nastajajoče virtualne družbe v njem živijo, delujejo in se premikajo. Skupno število registriranih prebivalcev ene

najzgodnejših različic metavesolja, Second Life, se je na primer samo v 18 mesecih (med letoma 2020 in 2022) povečalo s 64,687.961 na 66,614.470 (Second Life, 2022b; Voyager, 2021). Ti prebivalci ali spletne skupnosti ustvarjajo vsebino ali uporabljajo ustvarjeno vsebino, ki se nanaša na raznovrstne teme: nakupovanje, fantazijske vsebine, igrice, umetnost, glasba, rekreacija, poslovne vsebine, zgodovina, izobraževanje, neprofitne organizacije, družbena ozaveščenost, hobiji, šport itd. (Second Life, 2022a). Poleg tega se navedene skupnosti združujejo v (spletne) družbe, ki lahko organizirajo tudi družabne dogodke in v njih sodelujejo. V okviru teh dogodkov lahko posamezniki tudi zaslužijo nekaj denarja, saj lahko prek decentralizirane verige blokov kupujejo in prodajajo vsebino z nezamenljivimi žetoni v kriptovalutah (Cheng idr., 2022). Kljub vsemu se ne pričakuje, da bi izkušnje, ki jih omogoča metavesolje, v večjem obsegu zamenjale trenutne digitalne stike, verjetno pa bodo mnoge take stike izpodrinile z omogočanjem novih oblik stikov in poslovnih modelov (Nguyen, 2021). Po napovedih podjetja Gartner (Rimol, 2022) naj bi do leta 2026 25 % ljudi vsaj eno uro na dan uporabljalo metavesolje za delo, nakupovanje, izobraževanje, druženje ali razvedrilo, brez potrebe po kakršnem koli fizičnem prostoru.

Na podlagi statističnih podatkov in dejstev, objavljenih v raznih virih (Statista Research Department, 2021; Johnson, 2022; Wise, 2022), je jasno, da metavesolje čedalje bolj postaja alternativno sredstvo za stike med ljudmi (med posameznikoma, med posameznikom in skupino ter med skupinami) v okviru raznih aktivnosti. Kot poudarja Hemmati (2022), se bo glede na pričakovani razvoj dogodkov navedena tehnologija širila in bo zlasti v prihodnjih desetletjih močno vplivala na življenje ljudi. Predvidevamo lahko, da bo *metavesolje* postalo nov krovni pojem za virtualno okolje, ki fizično in virtualno povezuje današnje nastajajoče metadružbe ter poslovne, politične in družbene sisteme, ki so trenutno v virtualnih okoljih in se razvijajo v njih. Če se bodo tovrstne aplikacije, naprave in infrastruktura še naprej razvijale in bodo še naprej podprte z omrežji povezanih izkušenj, bo metavesolje lahko celo nadomestilo nekatera območja aktivnosti v (resničnem) mestnem prostoru. V knjigi *City of Bits: Space, Place and the Infobahn* je William J. Mitchell že leta 1995 pisal o tem, da se nekatere aktivnosti preusmerjajo pod vplivom razvijajočih se tehnologij (npr. iz skladišč na strežnike, iz galerij v virtualne muzeje, iz gledališč v virtualne kulturne in razvedrilne prostore, iz šol v virtualne kampuse in iz bolnišnic v storitve telemedicine). Z napredkom tehnologij, ki podpirajo metavesolje, ter informacijskih in komunikacijskih tehnologij ne bo nič nenavadnega, če se bodo tovrstni prostori v mestih do leta 2025 temeljito spremenili, zlasti ker se spreminjajo tudi stiki in, kot ugotavlja John (2017), to, kako počnemo stvari. S tehnološkim napredkom se bosta spremenila način vzpostavljanja stikov in sredstvo, prek katerega ti stiki potekajo (Ulubaş Hamurcu in Terzi, 2022).

Stiki postajajo čedalje bolj digitalni in so čedalje manj odvisni od kraja (Ulubaş Hamurcu in Terzi, 2022). S tega vidika se odpirajo številna pomembna vprašanja. Katere oblike mestne rabe bodo zamenjale nove, ki bodo omogočale fizične in digitalne izkušnje, ki jih zagotavlja (ali jih bo zagotavljalo) metavesolje? Ali bodo nekatere od njih odstranjene z resničnih mestnih območij, ker zanje ne bo več potrebe ali povpraševanja? Kako se bodo prilagodile spremembam in se preoblikovale, da bodo omogočale uporabo potrebne infrastrukture, sistemov in orodij? Pojma spletne skupnosti in (resnični) mestni prostor se v članku navezujeta na nastajajočo se literaturo o metavesolju. Ker je avtoričin glavni namen obravnavati možne vplive razvoja metavesolja na (resnični) mestni prostor, se v posameznih poglavjih osredotoča na opredelitev spreminjajočih se pomenov posameznih konceptov, povezanih z metavesoljem, pri čemer uporabi metodi sinteze in prilagoditve teorije družbeno-prostorske dialektike (za pregled literature glej Jaakkola, 2020). Avtorica poda splošno oceno družbeno-prostorskih vplivov razvoja metavesolja in spodbudi razpravo o tem vprašanju. Članek konča s sklepnimi ugotovitvami in nekaterimi zadržki.

2 Družbeno-prostorska dialektika: spreminjajoči se pomeni spletnih skupnosti in (resničnih) mestnih prostorov

V skladu z družbeno-prostorsko dialektiko se prostor proizvaja v ponavljajočem se nizu dejanj, pri čemer je na podlagi argumenta, da družbena prostorskost oblikuje prostor in je od njega hkrati tudi odvisna, posameznik lahko subjekt ali objekt dejanja (Soja, 1989). Gre za dvosmerni odnos med človekom in fizičnim okoljem. Podobno kot napredek informacijske in komunikacijske tehnologije tudi virtualni svet postaja širši izraz našega osebnega in kolektivnega prostora ali interaktivna prostorska razsežnost, ki jo oblikujemo, hkrati pa prav ta razsežnost oblikuje nas (Moneta, 2020: 48). Ta dejanja potekajo tako v fizičnem kot virtualnem prostoru ter razkrivajo zabrisano območje med fizičnim obstojem človeka in njegovimi dejanji v fizičnem okolju na eni strani ter njegovo identiteto (in dejanji) v virtualnih omrežjih na drugi strani (Ulubaş Hamurcu in Terzi, 2022; glej sliko 1).

Kot sredstvo in posrednik, ki združuje fizičnost in virtualnost, je tudi metavesolje na omenjenem zabrisanem območju. Gaggioli (2017: 744) opredeljuje prostor, ki izvira iz čedalje večjega spajanja fizične in virtualne razsežnosti, kot figitalni prostor (kot kombinacijo fizičnega in digitalnega) in ga razlaga kot preobrazbo človekovih življenjskih prostorov (hiš, pisarn, javnih prostorov itd.) v digitalno razširjenih okoljih, v katerih je zabrisana razlika med resničnim in simuliranim. To
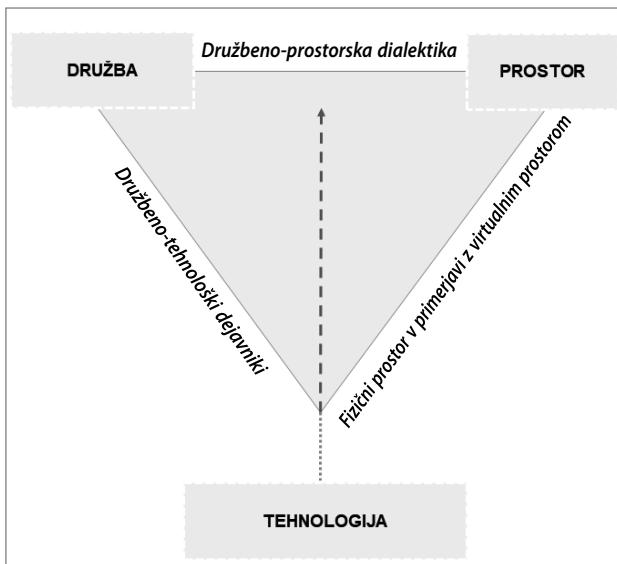
Slika 1: Povezave med družbo, prostorom in tehnologijo (prirejeno po: Ulubaş Hamurcu, 2021)

preobrazbo povzroča čedalje večji napredek na področju tehnologij, kot so razširjena resničnost, internet stvari, robotika in umetna inteligenca. V tem pogledu je tudi metavesolje vrsta figitalnega vesolja, saj prek aplikacije, orodja ali izdelka omogoča novo virtualno resničnost (van der Merwe, 2021). Kot ugotavlja Gaggioli (2017: 744), se z integracijo računalnikov v vsakdanje predmete in s čedalje večjim dvosmernim pretokom informacij med digitalnim in fizičnim svetom okolje, ki nas obdaja (vključno z našimi telesi), spreminja v nemoteno programirljiv vmesnik, pri čemer se lahko skoraj vsak predmet ustvarjalno preoblikuje tako, da omogoča nove vrste figitalnih izkušenj.

Pri metavesolju se figitalne izkušnje kot del družbene prostorskosti ustvarjajo tako fizično kot virtualno v realnem času, ne glede na lokacijo uporabnikov. Po drugi strani se lahko uporabniki s prostorom povežejo in z njim vzpostavijo stik, ne da bi bili nanj vezani (ali od njega odvisni). Pri tem so še vedno fizično in digitalno povezani z orodji in infrastrukturo, ki jim omogočajo dostop do metavesolja, ki omogoča potopitveno izkušnjo in na katero se postopno navežejo. V nadaljevanju sta zato najprej opisana spreminjajoča se narava stikov med uporabniki, ki niso odvisni od kraja, in napredek na področju razvoja metavesolja (v podpoglavju 2.1), nato pa je predstavljen še položaj (resničnega) mestnega prostora (v podpoglavju 2.2).

2.1 Od spletnih skupnosti k metadružbam

Spletna skupnost je opredeljena kot kolektivna skupina subjektov, posameznikov ali organizacij, ki se začasno ali trajno združijo prek elektronskega sredstva, da bi komunicirali o skupnem problemu ali interesu (Plant, 2004: 54). Uporabniki dojemajo

spletne skupnosti kot orodje, način bivanja in kraj (Markham, 1998). Na spletnih platformah in družbenih omrežjih se predstavljajo z digitalnimi avatarji in se v virtualnem prostoru z izvajanjem nešteto možnih dejanj obnašajo tako, kot si želijo (Liboriussen, 2012). Spletne platforme in družbena omrežja zato niso samo osnovna orodja, ki omogočajo vstop v virtualno okolje, ampak so tudi prostor, v katerem se zbirajo spletne skupnosti. Z razvojem informacijske in komunikacijske tehnologije danes metavesolje čedalje bolj postaja tako posrednik kot sredstvo, ki omogoča tudi stike in odnose brez internetne povezave, na podlagi katerih nastajajo in se širijo metadružbe. Kot povzema Berg (2012: 176), tradicionalna družbena omrežja uporabnikom pomagajo samo vzpostaviti družbene odnose, se predstaviti, opazovati drug drugega in izraziti odnose prek grafičnega uporabniškega vmesnika. Še vedno so samo posrednik, ne pa tudi sredstvo. Cilj metavesolja je tovrstnim spletnim platformam dodeliti novo nalogo, in sicer naj bi zagotavljale prostor spletnim skupnostim ali, z drugimi besedami, postale sredstvo, s katerim lahko spletne skupnosti sodelujejo s svojimi izkušnjami. Kot omenjajo Wang idr. (2022: 5), bodo metadružbe delovale vzporedno z resničnimi družbami, pri čemer bo vsak posameznik, podjetje ali mesto v resnični družbi imel/imelo svojega dvojnika v virtualni družbi. Metadružbe bodo tako omogočale sočasne virtualne in resnične stike, ki se bodo hkrati izražali v zadevnem prostoru. Berg (2012) navaja, da se razlikovanje med fizičnim in digitalnim svetom navezuje tako na ontološke kot praktične vidike družbenih stikov. Z napredkom na področju informacijskih in komunikacijskih tehnologij pa meje med fizičnimi in digitalnimi stiki izginjajo, posledično pa tudi med fizičnimi in digitalnimi prostori, ki te stike opredelijo in oblikujejo (kar je v skladu z družbeno-prostorsko dialektiko). Ves ta tehnološki napredek torej omogoča ustvarjanje figitalnih prostorov, ki omogočajo figitalne izkušnje.

Koncept družbe 5.0 naj bi omogočal precejšnje zlitje kibernetičnega (virtualnega) in fizičnega (resničnega) prostora. Družba 5.0 se osredotoča na človeka in vzpostavlja ravnovesje med gospodarskim napredkom in reševanjem družbenih problemov prek sistema, ki ključno združuje kibernetični in fizični prostor (Cabinet Office, 2022). Družba 5.0 je torej začetna faza, do katere bi se morale zdajšnje spletne skupnosti razviti v okviru razvoja metavesolja in podobnih tehnologij. Doseči bi morala naslednje cilje: 1. na razpolago bi morala biti vsem, ne glede na starost in spol, 2. ljudi bi morala osvoboditi napornega dela in jim omogočiti učinkovito porabo časa, 3. ljudem bi morala zagotoviti čas za prostočasne aktivnosti in 4. omogočiti bi morala boljša in varnejša življenjska okolja (Cabinet Office, 2022). Cilj metavesolja kot storitve je sporočati trajnostno vsebino, ki ima neki družbeni pomen (S.-M. Park in Kim, 2022). Družba 5.0 naj bi se torej udejanjala v okviru metavesolja, ki bo delovalo hkrati kot posrednik in sredstvo.

Če se družba 5.0 zares udejanji, lahko to povzroči novo družbeno-prostorsko spremembo. Ne smemo pozabiti, da je razvoj družbenih omrežij povzročil družbeni preobrat v dojemanju interneta (Berg, 2012). Kot navaja Berg (2012: 175), se digitalni prostor ne dojema kot ločeno družbeno okolje, ampak čedalje bolj kot prostor, ki je močno vpet v vsakdanje življenje, in kot izziv današnjim oblikam družbene organizacije v fizičnem prostoru. Hkrati se je s pojavom medijev, ki temeljijo na lokaciji, zgodil prostorski preobrat (Castells, 2004; Jansson in Falkheimer, 2006; Wilken, 2008; Berg, 2012). Kot ugotavlja Graham (2004), naj bi tovrstni mediji povzročili razpad mest ter začeli homogenizacijo in prenos krajev kot del spremembe družbenih sistemov. Razloga za to naj bi bila prehod od fizičnega k virtualnemu in to, da človek namesto telesa iz fizičnega okolja razširja svojo obliko obstoja v virtualnem okolju. V skladu z družbeno-prostorsko dialektiko pa družbenega in fizičnega subjekta ne moremo obravnavati ločeno, kot dve spremenljivki ustvarjanja prostora, saj se prepletata in nobena ne prevladuje nad drugo. Z vidika metavesolja bi zato morale razprave o družbenem in prostorskem preobratu vključevati tudi družbeno prostorskost (prim. Berg, 2012) kot sredstvo prepletanja virtualnih in fizičnih družbenih odnosov in stikov (ali figitalnih izkušenj), ki pod vplivom družbeno-tehnoloških dejavnikov potekajo na zabrisanih mejah med resničnim mestnim prostorom in virtualnim okoljem (tj. v figitalnem prostoru) (glej tudi Ulubaş Hamurcu, 2021, ter Ulubaş Hamurcu in Terzi, 2022). Pregled možnih vplivov teh dejavnikov na (resnični) mestni prostor v povezavi z metavesoljem je predstavljen v tretjem poglavju.

2.2 Od (resničnega) mestnega prostora k metamestom

Kemec (2022) navaja, da aplikacije, ki jih zagotavlja metavesolje, omogočajo nove poslovne, nakupovalne, izobraževalne, športne, družbene, kulturne in umetniške izkušnje v mestih. Raznovrstne funkcije metavesolja se izvajajo prek digitalnih dvojčkov – obsežnih digitalnih modelov in subjektov, ki se z visoko kakovostjo reproducirajo v virtualnih okoljih in izražajo lastnosti svojih fizičnih različic v resničnem mestnem prostoru (Lee idr., 2021: 1–2). Omogočajo izvajanje heterogenih aktivnosti v realnem času, ki imajo neomejeno število sočasnih uporabnikov (Lee idr., 2021: 2). Zato ni mogoče obravnavati vseh oblik figitalnega prostora in figitalnih izkušenj (tudi zato, ker je metavesolje še v razvojni fazi), lahko pa jih naštejemo vsaj nekaj, da dobimo predstavo o tem, kakšno prihodnost omogočajo.

Mac Ghlionn in Hamilton (2022) figitalno izkušnjo v metavesolju ponazorita takole: opremljen z očali za izkušnjo VR in oblečen v pametna oblačila, vključno s haptičnimi rokavicami,

se doma sedeči popotnik lahko dotakne Partenona v Atenah ali okusi gosto peno korejske kave dalgona. Znani so tudi primeri iz gospodarskih, izobraževalnih, vladnih in celo verskih sistemov. Prehod na virtualna delovna mesta v metavesolju med pandemijo covida-19 je konkreten primer družbeno-prostorskih vplivov metavesolja na (resnični) mestni prostor. Podjetje Meta je za spletne sestanke razvilo aplikacijo Horizon Workrooms, Microsoft pa namerava svojo platformo za izkušnjo VR Mesh združiti z aplikacijo Teams (Lawrence, 2021). Platforme, kot so Gather, Teamflow in Virbela, omogočajo spletno druženje in poskušajo olajšati težave, s katerimi se uporabniki srečujejo pri uporabi tradicionalnih komunikacijskih sredstev, pri katerih lahko druge gledajo samo po računalniškem zaslonu. Podobno Choi (2022) ugotavlja, da zaposleni pri delu od doma veliko raje uporabljajo metavesolje kot pa tradicionalna komunikacijska sredstva. Na področju izobraževanja so znani primeri povezovanja različnih udeležencev iz različnih organizacij in območij, ki sodelujejo pri skupnih projektih (Suzuki idr., 2020), in primeri obravnavanja metavesolja kot sredstva, ki omogoča trajnostno izobraževanje, pri katerem ni vnaprej opredeljenih omejitev, kot sta čas in prostor (S. Park in Kim, 2022). Seul je prvo velemesto, ki je sporočilo, da se pripravlja na vzpostavitev platforme na podlagi metavesolja in ta platforma bo omogočala izvajanje gospodarskih, izobraževalnih, kulturnih, turističnih, komunikacijskih, urbanističnih, upravnih in infrastrukturnih nalog ob upoštevanju trendov in potreb javnega in zasebnega sektorja (Seoul Metropolitan Government, 2022). Do leta 2023 naj bi platforma začela omogočati posvete in druge storitve javne uprave, ki jih trenutno opravljajo uslužbenci mestne hiše v Seulu, na njej pa deluje celo cerkev, v kateri lahko ljudje molijo (Dsouza, 2022). Ker je metavesolje šele v razvojni fazi, ni jasno, koliko tovrstnih virtualnih okolij in z njimi povezanih spletnih skupnosti bo dejansko zaživelo in kako dolgo se bodo obdržali.

3 Razprava: pregled možnih družbeno-prostorskih vplivov metavesolja

Pandemija covida-19 je pokazala, da smo v nekaterih situacijah tehnološko omejeni (Ulubaş Hamurcu, 2021). Med pandemijo so informacijske in komunikacijske tehnologije postale nepogrešljiv del našega vsakdanjika. Zaradi omejitev gibanja v družbi so se vsi izdelki in storitve začeli prodajati ali zagotavljati na internetu, vse je dostopno samo s klikanjem. Nepričakovana obvezna uporaba tovrstnih tehnologij je spremenila domnevanja o vplivu novo nastajajočih tehnologij in izdelkov na tehnološkem trgu (Panetta, 2021) ter razprave o njihovi prilagodljivosti uporabniku in uporabnosti za uporabnika ter njihovih družbeno-prostorskih vplivih na mesta (Ulubaş Hamurcu, 2021; Ulubaş Hamurcu in Terzi, 2022).

(Resnični) mestni prostor je pod vplivom spreminjajočega se načina delovanja, ki je posledica tehnološkega napredka (John, 2017). Po eni strani naj bi nekatere družbeno-tehnološke skupine poskušale izboljšati svoje razmere s pridobitvijo tovrstne tehnologije, ki bi jo učinkovito uporabljale in si s tem olajšale dnevne aktivnosti in naloge (Allam in Jones, 2021; Ulubaş Hamurcu, 2021). Pri tem bi lahko (ali naj bi) nekatere vrste rabe prostora zamenjali digitalni dvojčki oziroma nekatere storitve ali bi bile rabe na razpolago virtualno (npr. poslovne, izobraževalne, razvedrilne in javne/vladne storitve in objekti). Nekateri primeri so že bili predstavljeni v podpoglavju 2.2. Po drugi strani naj bi nepričakovana nujna uporaba informacijskih in komunikacijskih tehnologij med pandemijo covida-19 med uporabniki okrepila zavedanje o pomenu (resničnega) mestnega prostora, zaradi česar bodo v prihodnje od lokalne uprave pričakovali, da jim zagotovi mestna območja, infrastrukturo in storitve višje kakovosti (Allam in Jones, 2021; Ulubaş Hamurcu, 2021). Kljub vsemu bo metavesolje še vedno na urbanističnem dnevnem redu. Z virtualnimi simulacijami v metavesolju se lahko ustvarijo vzporedne različice mest, v katerih lahko mestne uprave preizkušajo svoje politike in vizije (Devisch, 2016; Martynova, 2020) ter iščejo boljše rešitve za težave, ki se v mestih pojavljajo, ali načine za razbremenitev zdajšnjih sistemov. Digitalni dvojčki so lahko zelo koristni, saj zagotavljajo več priložnosti za sodelovanje v zgodnji fazi projektov in hitro odločanje (Nazir, 2020). Bizjak (2012) predlaga, da bi bilo treba izboljšati orodja, ki omogočajo e-sodelovanje v prostorskem načrtovanju in oblikovanju.

Obstaja pa še druga možnost. Kot ugotavlja Roy (2020), so pandemije običajno ljudi prisilile, da so prekinili stike s preteklostjo in si svet zamislili na novo. Tudi ta pandemija ni nič drugačna, je le prehod med prejšnjim in prihodnjim svetom. Mesta se bodo zato posvetila snovanju in načrtovanju območij mešane rabe, ki omogočajo sočasno izvajanje raznih fizičnih in virtualnih aktivnosti ter sočasne fizične in virtualne stike (Ulubaş Hamurcu in Terzi, 2022). Z uresničevanjem koncepta metavesolja se bodo njegovim potrebam prilagodili tudi storitve in fizično okolje uporabnikov. Posamezni poklici, vlagatelji in lokalne uprave bodo morali slediti novostim na področju tehnološkega razvoja in jih prilagoditi fizičnemu okolju. Poleg tega se bodo za zadovoljevanje potreb lahko pojavila nova mestna območja in prostori. Ker sta za vstop v metavesolje potrebna samo posebna oprema, kot so očala za izkušnjo VR, mobilni telefoni in računalniki, ter dostop do interneta, se bo lahko prostor, potreben za izvajanje nekaterih aktivnosti (npr. nakupovanje, rekreacijo, izobraževanje in delo), skrčil, pri nekaterih aktivnostih pa se bo lahko celo povečal in tako uporabniku omogočil premikanje med uporabo opreme za izkušnjo VR. Družbeno-prostorski vplivi metavesolja bodo torej lahko zelo različni.

Metavesolje ima trenutno tudi nekatere omejitve, kot so na primer pomanjkanje enotnosti, stalnosti in splošnih standardov, težave, povezane z dostopnostjo, inkluzivnostjo in globalno povezanostjo, slaba družbena sprejemljivost ter vrzel med najnovejšimi tehnologijami in zahtevami metavesolja. Vsako platformo v metavesolju upravlja drugo podjetje, pri čemer ni enotnega sistema (Lim idr., 2022). Nadaljnje delovanje teh platform bo odvisno od storitev, ki jih zagotavljajo, oziroma od njihove razširjenosti med uporabniki. Za takojšen dostop do nekaterih platform zadošča pametni telefon in internetna povezava, druge pa za dostop zahtevajo prijavo, naročnino, edinstveni identifikator ali digitalno denarnico (van der Merwe, 2021). Zato se je treba vprašati tudi, ali metavesolje sploh lahko doseže svoj cilj, tj. zagotavlja trajnostno vsebino z družbenim pomenom v okviru družbe 5.0, glede na digitalni razkorak in razlike v digitalni pismenosti ljudi. Poleg tega bi moralo metavesolje za izpolnjevanje navedenega cilja postati družbeno sprejemljivo. Kot navajajo Lee idr. (2021), bodo na trajnostnost metavesolja pomembno vplivali dejavniki, kot so varstvo zasebnosti, raznovrstnost uporabnikov, pravičnost in odvisnost uporabnikov, zato bo treba za zagotavljanje varnosti in zasebnosti uvesti dodatna pravila in norme. Poleg tega je s pojasnjevanjem prednosti, ki jih metavesolje omogoča v primerjavi s tradicionalnimi komunikacijskimi sredstvi, ključno vključiti tudi druge generacije, ne samo generacijo Z, ki velja za glavnega uporabnika metavesolja (Kovach, 2021). Lee idr. (2021: 3) ugotavljajo, da so virtualna in razširjena resničnost, hitra omrežja, robno računalništvo, umetna inteligenca in verige blokov gradniki metavesolja. Hkrati opozarjajo na vrzel med najnovejšimi tehnologijami in zahtevami metavesolja, na podlagi katerih bo virtualni svet vgrajen v vsakdanje življenje ljudi. Infrastruktura 5G večinoma še ni na voljo. Ali se bo metavesolje obdržalo ali ne, je zato odvisno od napredka v razvoju tehnične infrastrukture in storitev, naložb vanje, njihovih meja ter od njihove ekonomske in geografske dosegljivosti za večino ljudi. Posledično ustrezna oprema ni edini temeljni pogoj za dostop do metavesolja in njegovo učinkovito uporabo.

4 Sklep

Zaradi diverzifikacije figitalnih izkušenj in prostorov, ki so uporabnikom na voljo na spletnih platformah, se bodo potrebe metavesolja v prihodnosti razlikovale od današnjih, hkrati se bodo spremenile njihove vsebine, na primer kulturna, ekonomska, socialna, tehnološka in politična vsebina. Ob možnem pojavu neskončnega števila hetero(krono)topij se pojavljajo nekateri zadržki glede svetovnih politik in gospodarstev. Ker razvoj metavesolja ni usklajen, je njegova prihodnost negotova. Kljub vsemu bodo dosežki, kot je metavesolje, spremenili fizične in virtualne družbeno-prostorske odnose. Allam in Jones

(2021: 3) navajata, da več ko bo inovacij, manj bo potrebe po človekovi vpletenosti in težje bodo digitalni nepismeni ali ludisti razumeli ta novi svet in se v njem znašli. Tovrstne družbeno-tehnološke skupine se bodo zato poskušale prilagoditi navedenim osupljivim spremembam, razprave o digitalni pismenosti in digitalnem razkoraku pa se bodo nazadnje premaknile k premagovanju tega problema in iskanju rešitev, ki podpirajo družbeno trajnostnost.

Poleg tega bo tehnološki napredek vplival na koncepta navezanosti na kraj in odvisnosti od kraja (Ulubaş Hamurcu, 2021). Kot že omenjeno, na odvisnost od kraja vplivajo samo infrastruktura in storitve, ki so na voljo uporabnikom. Z navezanostjo na kraj pa je drugače: lahko gre za navezanost na fizični ali družbeni subjekt ali celo na oba hkrati (Ulubaş Hamurcu, 2021). Metavesolje izkorišča navezanost uporabnikov na izbrani subjekt. Stopnja prilagojenosti odnosom in storitvam, ki jih zagotavljajo metadružbe, in virtualno okolje, ki ga ustvarjajo, bosta imela odločilen družbeno-prostorski vpliv na prihodnost (resničnega) mestnega prostora. Na podlagi navedenega se bodo oblikovale nove družbeno-tehnološke skupine v resničnih družbah. Družbeno-tehnološke skupine v metavesolju (in prek njegove uporabe) nastajajo asinhrono in neodvisno od fizičnega prostora. Za boljše razumevanje tega, kaj pričakujejo od metavesolja in resničnega mestnega prostora, bi jih bilo treba v nadaljnjih raziskavah analizirati in na podlagi dobljenih izsledkov opredeliti družbeno-prostorske vplive figitalnih izkušenj.

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Igrišča v digitalnem mestu: pristop z vidika razširjene resničnosti

To, da otroci uporabljajo tehnološke naprave, je danes nekaj običajnega, hkrati pa so zaradi tega otroci manj prisotni na mestnih prostorih. Čeprav v mestu razvijajo socialne, umske, učne in druge spretnosti, mnogi iz različnih razlogov ne sodelujejo pri tem. Za vpetost otrok v mestni prostor je torej ključno, kako je prostor v njihovem fizičnem mestu oblikovan in kakšna je interakcija otrok s takim mestnim prostorom. V otrokom prijaznem mestu se lahko za večjo vpetost otrok uporabijo sodobna orodja, kot je razširjena resničnost, ta otrokom pomaga izboljšati komunikacijske veščine, poleg tega spodbuja razvoj prostorskih zaznav ter telesnih in socialnih spretnosti v fizičnem in digitalnem svetu. Avtorja v članku proučujeta različne aplikacije in pri vsaki analizirata značilnosti, na podlagi katerih je lahko mesto prijaznejše otrokom. Razširjeno resničnost predstavita kot eno izmed orodij, zaradi katerih so mesta lahko otrokom prijazna, tj. postanejo družbeno vključujoča mestna okolja, v katerih se otroci igrajo, preživljajo prosti čas in odraščajo.

Ključne besede: razširjena resničnost, otrokom prijazna mesta, zaznavanje mestnega prostora, digitalna mesta, socialna vključenost v digitalnem okolju

1 Uvod

Zaradi hitre urbanizacije po vsem svetu in čedalje večje privlačnosti mest za mlade družine, mesta postajajo glavna okolja, v katerem bodo odraščale nove generacije otrok (Aji idr., 2016). Po napovedih Organizacije združenih narodov naj bi do leta 2025 kar 60 % otrok po svetu živelo v mestih (Krishnamurthy, 2019). Unicef *otrokom prijazno mesto* opredeljuje kot mesto, v katerem imajo otroci pomembno vlogo in lahko kot mestni prebivalci vplivajo na mestno politiko, poleg tega se v takem mestu spoštujejo pravice otrok. Imajo pravico do družinskega življenja, imajo možnost življenja v skupnosti in sodelovanja v družabnih aktivnostih ter imajo dostop do osnovne zdravstvene oskrbe in izobraževanja, pri tem so varni pred trgovino z ljudmi, nasiljem in drugimi zlorabami. Otrok ima torej pravico, da se med igro s prijatelji na ulici počuti varnega, živi v okolju, ki ni onesnaženo, sodeluje v družabnih in kulturnih aktivnostih ter ima dostop do zelenih površin in vseh glavnih storitev ne glede na svojo etnično pripadnost (Ceren Mavikurt, 2019).

V zadnjih nekaj desetletjih so se na podlagi hitrega tehnološkega napredka razvile nove tehnologije, ki bodo v mestih najverjetneje spremenile izkušnje v zasebnem življenju in na delovnem mestu (Luusua, 2016). Ena od tovrstnih digitalnih tehnologij je razširjena resničnost, ki se uporablja na različnih področjih, tudi v arhitekturi in urbanističnem oblikovanju. Večina otrok uporablja tehnološke naprave, kar so potrdile tudi številne raziskave, ki so bile v zadnjih letih opravljene v številnih državah. V zadnjem desetletju se je močno razširila uporaba zlasti naprav z zaslonom na dotik, kot so tablice in pametni telefoni. Tudi pandemija covida-19 je spremenila ritem mestnega življenja ter močno zmanjšala prisotnost in aktivnost ljudi v mestnem prostoru. S sprostitvijo ukrepov po pandemiji se mesta postopno vračajo v stanje pred pandemijo, vendar je obdobje strogih ukrepov vplivalo na to, da zdaj čedalje več otrok uporablja digitalne naprave (Romanillos idr., 2021). Ob tem otroci tovrstne mobilne naprave uporabljajo čedalje več časa. Podatki za ZDA za leto 2020 kažejo, da je 97 % gospodinjstev imelo vsaj en pametni telefon in da je 75 % družin imelo v lasti pametno tablico, pri čemer je 44 % otrok imelo svojo tablico (Konca, 2021). V mnogih razvitih državah imajo stik s tehnologijo že zelo majhni otroci in ti različne naprave uporabljajo kar veliko časa. Negativna plat tega je, da je na mestnih prostorih čedalje manj otrok. Nekatere mobilne igre, ki temeljijo na razširjeni resničnosti, na primer Pokemon Go, od uporabnikov zahtevajo, da se gibljejo po mestu in iščejo pokemone, kar spodbuja njihovo telesno aktivnost ter posledično izboljšuje njihova zdravje in počutje (Potts idr., 2017, Oduor in Perälä, 2021).

Avtorja v članku proučujeta razširjeno resničnost kot eno izmed tehnologij, ki jo lahko uporabljajo otroci, kot vmesnik, ki otroke spodbuja, da so prisotni na mestnih prostorih, in kot sredstvo, ki omogoča uresničevanje koncepta otrokom prijaznega mesta. Proučujeta tri primere aplikacij, ki temeljijo na razširjeni resničnosti in s katerimi lahko otroci na mestnem prostoru izkusijo številne značilnosti otrokom prijaznega mesta ter s prisotnostjo na digitalno obogatenem mestnem prostoru razvijajo različne uporabne spretnosti. Poleg tega analizirata vidike otrokom prijaznega mesta, ki jih omogočajo navedene aplikacije in ki otrokom pomagajo izboljšati interakcijo z mestnim prostorom. Avtorja se osredotočata samo na prakse v razvitih državah, zaradi hitrega tehnološkega razvoja po vsem svetu pa bo podobne primere najverjetneje kmalu mogoče opazovati marsikje po svetu. Njuno proučevanje je slonelo na teh raziskovalnih vprašanjih: Kako lahko otroci z uporabo razširjene resničnosti izboljšajo svoje zaznavanje mestnega prostora? Kako lahko razširjena resničnost pripomore k vpetosti otrok z mestom in razvoju tovrstnih raznih spretnosti?

V skladu s ciljem članka in navedenima raziskovalnima vprašanjema sta se avtorja pri pregledu literature osredotočila na ključne besede, kot so *razširjena resničnost*, *razširjena resničnost in otrokov razvoj*, *prisotnost otrok na mestnem prostoru in njihovo zaznavanje tega prostora* ter *otrokom prijazno mesto*.

1.1 Pregled literature

Raziskovalci po vsem svetu poskušajo z razvojem teorij ter proučevanjem dejstev in izkušenj pojasniti in ponazoriti značilnosti in zmožnosti razširjene resničnosti, ki zlasti v zadnjem desetletju priteguje pozornost. Raziskava, predstavljena v tem članku, dopolnjuje niz raziskav o povezavah med mestom, tehnologijo in igrami, te raziskave pa so bile opravljene v okviru doktorskih disertacij. Navarro Redón (2020) in Roig Segovia (2014) sta na primer proučevala povezavo med prostorom za igro v fizičnem svetu in v videoigrah ter okolja razširjene resničnosti kot stičišča digitalne tehnologije in tradicionalnih prostorskih oblik, ki omogočajo združevanje fizičnega prostora in digitalnega okolja.

V zvezi s pojmom razširjene resničnosti in njenih značilnosti je treba omeniti študije avtorjev, kot so Mackay (1996), Azuma (1997), Ariso (2017) in Saßmannshausen (2021), ki so navedeno tehnologijo opredelili kot orodje, ki se uporablja na različnih področjih in uporabniku omogoča, da vidijo fizični svet, obogaten z virtualnimi predmeti, ki so nanj projicirani. Omenjeni raziskovalci navajajo še, da razširjena resničnost uporabnikom pomaga izboljšati telesne in umske spretnosti ter prostorske zaznave. Nijholt (2017a) je po drugi strani proučeval igrivost in primernost za igro v pametnih mestih, pri čemer

se je osredotočil na igre, ki mesto spremenijo v prizorišče iger, izkušnje ljudi v mestih in na to, kako lahko prebivalci sodelujejo pri oblikovanju in razvoju mesta. Omenja igrivo hekanje pametne mestne tehnologije, vragolije v pametnih mestih ter igrive interakcije med prebivalci in pametno tehnologijo na javnih mestnih prostorih.

1.2 Otroci in mestni prostor

Otroci morajo za razvoj raznih spretnosti in veščin pridobiti izkušnje v različnih okoljih (npr. doma, v šoli in na mestnem prostoru). Med aktivnostmi na prostem lahko svobodno preizkušajo različne stvari, tečejo, plezajo in skačejo ter s tem raziskujejo okolico. Odprt mestni prostor ima zato pomembno vlogo z vidika otrokovega zdravja, počutja in razvoja. Poleg tega mestni prostori otrokom omogočajo igro, družbeno interakcijo in samostojno mobilnost (Kyttä idr., 2018). Raziskave so pokazale, da otroci med odraščanjem običajno uporabljajo iste mestne prostore kot odrasli (npr. stavbe, tržnice, javne prostore in poti) (Nooraddin, 2020). V nasprotju z odraslimi so otroci pri raziskovanju okolice bolj telesno aktivni, saj med igro plezajo, skačejo in lovijo ravnotežje. Na ta način se z okolico sporazumevajo z izvajanjem aktivnosti, ki jih imajo radi, in uživanja v prostoru. Otroci uporabljajo ulico kot igrišče in kraj, na katerem preživljajo čas z vrstniki in se srečujejo z odraslimi. Jane Jacobs (1961: 81) je že v šestdesetih letih 20. stoletja zapisala, da otroci potrebujejo nenamenski prostor na prostem, ki ga lahko uporabljajo kot svojo bazo za igranje, druženje in oblikovanje predstav o svetu. Ulice bi bile lahko prav to. Otroci lahko na ulici razvijajo socialne odnose, izboljšajo svoje socialne veščine in postanejo samostojni. Ulice poleg tega omogočajo najrazličnejše oblike igre (npr. igre z žogo, uporabo koles, skirojev in druge opreme, ki jo prinesejo od doma) (Gospodini in Galani, 2006). Druga vrsta prostora, ki ga otroci uporabljajo v mestu, so igrišča. Igrišča so namenski odprti prostori v mestih, zasnovani za otroke. Koncept otroških igrišč je bil razvit v 19. stoletju, ko se je začela urbanizacija naglo krepiti (Metin, 2003). Med pionirji oblikovanja otroških igrišč je bil arhitekt Aldo Van Eyck. Pri ustvarjanju se je osredotočal na mesta, arhitekturo in otroška igrišča, na tej podlagi pa je pred približno 60 leti v Amsterdamu vpeljal koncept mesta kot otroškega igrišča (Kim idr., 2017). Njegova otroška igrišča so preprosta in vsebujejo znane prvine, ki jih otroci zlahka razumejo in se nanje odzivajo (Lidón de Miguel, 2015).

V zgodnjih sedemdesetih letih 20. stoletja je Kevin Lynch v sodelovanju z Unescom v okviru projekta *Growing Up in Cities* (Odraščanje v mestih) proučeval, kako otrokova uporaba in razumevanje okolja vplivata na njegovo vedênje. Ugotovil je, da se otroci z raziskovanjem mesta in igranjem na mestnem prostoru naučijo uporabljati mestni prostor kot učni poligon. V 90. letih so raziskavo obudili in razširili ter jo izvedli v še

nekaterih drugih mestih. Njeni izsledki so pokazali, da otroci, ki so vključeni v družabno in kulturno življenje v mestu, razvijejo občutek pripadnosti mestu in se z njim močno poistovetijo (Bourke, 2012). Danes ima tehnologija pomembno vlogo na različnih področjih otrokovega življenja (npr. pri igri, odnosih s prijatelji in izobraževanju). Otroci uporabljajo najrazličnejšo tehnologijo in naprave za igranje iger: konzole, računalnike, mobilne telefone, tablice, dlančnike in razne platforme, na katerih so na voljo igre, ki temeljijo na razširjeni in navidezni resničnosti (Flynn idr., 2019). V primerjavi s prejšnjimi generacijami začnejo današnji otroci spoznavati digitalni svet v bolj zgodnji fazi razvoja zaznavanja okolice, kar še poglablja digitalni razkorak med generacijami. Posledica tega, da se otroci doma zabavajo in motijo z različnimi napravami, pa je, da so čedalje manj prisotni na mestnem prostoru. Problem bi lahko rešili z razvojem tehnologije, z uporabo katere bi uporabniki na mestnem prostoru izboljšali svoje umske in fizične spretnosti. Kot prebivalci digitalnih mest se lahko otroci zamotijo in zabavajo tudi tako, da tovrstno tehnologijo uporabljajo na bolj zdrav način. S tem bolj vzljubijo okolico in so z njo bolj zadovoljni, kar izboljša tudi kakovost njihovega življenja in jih spodbudi k temu, da so bolj vpeti v mestni prostor (Nijholt, 2017b).

1.3 Otrokovo zaznavanje mesta: zastarelost tradicionalnega javnega prostora

Zaznavanje se po navadi razume kot proces, pri katerem ljudje prejmejo informacije, jih predelajo in uporabijo za razumevanje svojega okolja. Kot navaja Kotler (1974), je zaznavanje proces sprejemanja, izbiranja, razvrščanja in razlaganja informacij. Ljudje se lahko z okoljem sporazumevajo tako, da se vanj vključijo in v njem pridobijo informacije, na podlagi katerih zaznavajo svojo okolico. Norberg-Schulz (1966) navaja, da se ljudje začnejo zavedati svoje okolice prek zaznavanja, ki jim pomaga razumeti okolico in z njo vzpostaviti odnos.

Otroci okolico prepoznavajo in zaznavajo s tipom, sluhom in vidom, prostorske zaznave pa razvijajo z opazovanjem, spraševanjem in postopno uporabo raznih spretnosti (Duzenli idr., 2019). Na razvoj otrokovih spretnosti močno vpliva njegova interakcija z okoljem. Otroci spoznavajo mestni prostor prek kognitivnega in afektivnega razvoja ter razvoja vrednot. Kognitivni razvoj se nanaša na otrokovo prepoznavanje prostorov igre ter odkrivanje prostorov, opreme in drugih prvin. Afektivni razvoj vključuje zavedanje telesnih dejavnikov in dejavnikov okolja ter občutljivost nanje, nanaša pa se tudi na pozitivna čustva in čustveno navezanost na kraj (Aziz in Said, 2016). Razvoj vrednot pa se nanaša na otrokov razvoj vrednot do narave, tudi estetskih (opazijo privlačnost narave) in humanističnih (na naravo so čustveno navezani), na podlagi katerih razvijejo občutek povezanosti z naravo. Na mestnem prostoru

postanejo občutljivi na okolico, kar jim omogoča, da začnejo raziskovati prostor in postajajo vpeti vanj (Kellert, 2002). Izkustveno zaznavanje tega otrokom omogoča, da med odraščanjem preizkušajo razne spretnosti in pridobijo raznovrstna znanja (Sulaiman in Ibrahim, 2019).

2 Priložnosti, ki jih otroku omogoča prijazno mesto

Koncept oblikovanja mest za vse, ki upošteva zlasti potrebe otrok, je leta 1996 v Italiji predstavil Unicef v okviru pobude otrokom prijaznih mest (Titis Rum Kuntari, 2018). Istega leta je bila v okviru mednarodne konference OZN o naseljih (Habitat II) organizirana delavnica, na kateri je bil poudarek na zagotavljanju varnih in zdravih bivalnih razmer za otroke in na kateri je bilo izpostavljeno, da je otrokovo dobro počutje največji pokazatelj zdravega okolja, ustreznega upravljanja in demokratične družbe (Al Arasi, 2013).

Zamisel o otroku prijaznem mestu ne temelji na vnaprej določenem končnem stanju ali scenariju. Je nekakšna predloga, ki jo lahko vsako mesto uporabi za to, da naredi svoje okolje, sistem upravljanja in storitve, prijaznejše otrokom. V zadnjih desetletjih so bili v povezavi z navedeno problematiko na mednarodnih konferencah sprejeti razni dokumenti, kot sta Agenda 21 (akcijski načrt, sprejet na konferenci Organizacije združenih narodov o okolju in razvoju) (Organizacija združenih narodov, 1992) in Agenda Habitat (sprejeta na 2. konferenci Organizacije združenih narodov o naseljih) (Organizacija združenih narodov, 1996). Deklaracija *A World Fit for Children* (Svet po meri otrok) (Unicef, 2008) spodbuja razvoj otrokom prijaznejših skupnosti in mest, ki temelji na vključevanju otrok, ter družinam, ustanovam in vladam nalaga pravno odgovornost za zagotavljanje in zaščito otrokovih pravic. Kot mestni prebivalci otroci okolico zaznavajo po svoje, njihove potrebe pa bi bilo treba upoštevati pri oblikovanju mest. Tonucci (2015) poudarja, da je mesto, ki je primerno za otroke, najboljše mesto za vse. Podobno Ward (1979) izpostavlja, da je pomembno, da je mesto oblikovano tako, da je primerno za otroke, ki lahko v njem sobivajo z drugimi generacijami.

3 Razširjena resničnost in otrokov razvoj

Razširjena resničnost se opisuje kot tehnologija, ki omogoča živ, posreden ali neposreden prikaz resničnega sveta, ki je prekrit z računalniško grafiko oziroma razširjen z videi, zvoki, GPS-podatki ali računalniško ustvarjenimi grafičnimi elementi (Hammad in Srivastava, 2017). Z združevanjem virtualnega in resničnega sveta se pojavi nova vrsta fizičnega prostora, ki bi

mu lahko rekli tudi razširjeni mestni prostor (Mesárošová in Hernández, 2018). Uporaba digitalnih tehnologij je med otroki zlasti v zadnjem desetletju skokovito narasla. Otroci so prihodnost naše družbe; imajo ključno vlogo pri njenem razvoju, hkrati pa tvorijo pomembno bazo strank za prodajo najnovejše tehnologije. V večini razvitih držav otroci uporabljajo sodobno tehnologijo za igranje iger, pogovor s prijatelji, pripovedovanje zgodb in učenje, kar v učenje, sporazumevanje in družbeno interakcijo vnaša nove razsežnosti (Mridha, 2018). Poleg tega vplivi digitalne dobe na življenje otrok še nikoli niso bili tako izraziti, saj so otroci doma in v lokalni skupnosti tovrstnim tehnologijam izpostavljeni že od malega (Marsh idr., 2019).

Razširjena resničnost otrokom omogoča interakcijo z okolico in virtualnim svetom, kar jim lahko pomaga razvijati prostorske zaznave ter telesne in socialne veščine (Gómez-Galán idr., 2020). Z uporabo razširjene resničnosti lahko raziskujejo in razumejo prostorske odnose med digitalnimi in resničnimi predmeti v mestu (Parmaksiz, 2017). Razširjena resničnost poleg tega krepi zaznavo fizičnega sveta in resničnost dopolnjuje s senzoričnimi dražljaji, s čimer lahko otroci bolje razvijajo čute (tip, vid in sluh) ter vidijo in slišijo več od tega, kar je trenutno v resničnem svetu (Bozkurt, 2017; Kiryakova idr., 2018). Razširjena resničnost lahko s simulacijo objektov v resničnem svetu pritegne otrokovo pozornost in mu pomaga, da sodeluje v namišljenem svetu. Krepi otrokov psihološki razvoj in v njem vzbudi željo po učenju (Chen idr., 2017). Vmesniki, ki temeljijo na razširjeni resničnosti, združujejo procesno in konfiguracijsko znanje. Procesno znanje se nanaša na občutke, ki jih uporabniki doživljajo v 3D-okolju, ko stojijo v svetu mešane resničnosti ali se po njem premikajo. Konfiguracijsko znanje pa se nanaša na interakcijo, ki jo uporabnik doživlja ob držanju 3D-modela in opazovanju resničnega prostora (Hedley in Shelton, 2004). Z uporabo razširjene resničnosti lahko torej otroci zaznavajo okolico in se veliko naučijo, s čimer razvijajo razne spretnosti. Glede na to, da so otroci že sami po sebi nagnjeni k uporabi novih tehnologij, bi jim morala orodja, kot je razširjena resničnost, na primeren način pomagati, da izboljšajo svoje spretnosti in se postopno vključijo v družbo. Ta jim lahko tudi kot učno orodje pomaga izboljšati socialne in telesne spretnosti ter prostorske zaznave.

Ob neustreznem nadzoru uporabe ima lahko tovrstna tehnologija tudi negativne posledice za zdravje, pri otrocih pa lahko povzroči tudi druge težave, kot sta pomanjkanje telesne aktivnosti in odvisnost (Ng in Ma, 2019). Ob neprimerni uporabi lahko uporabniki postanejo odvisni od naprav, hkrati pa se zaradi njih izolirajo od družbe v fizičnem svetu. V današnjem svetu bodo otroci neizogibno uporabljali digitalne naprave, zato jim razširjena resničnost ob ustrezni uporabi omogoča interakcijo z resničnim svetom. Čeprav je to lahko tudi nekoliko zapleteno, bo vse verjetno postalo lažje z napredkom v

razvoju digitalnih naprav ter s spretnostmi generacije, ki že od mladosti uporablja take digitalne tehnologije.

4 Proučevani primeri

Avtorja sta izbrala tri digitalne aplikacije – *Minecraft Earth, EduPARK* in *UrbanAR* – kot primere, ki s svojimi prvinami razširjene resničnosti omogočajo otrokom prijazno mesto ter spodbujanje in razvijanje uporabnih spretnosti pri otrocih v mestnem okolju. Za vsako sta analizirala značilnosti otrokom prijaznega mesta, ki jih lahko otroci prek skupne igre izkusijo v fizičnem in digitalnem svetu, in jih med seboj primerjala.

Mobilna igra *Minecraft Earth* temelji na razširjeni resničnosti. Podjetje Mojang Studios jo je razvilo leta 2009, junija 2021 pa ji je prenehalo zagotavljati podporo. V igri *Minecraft Earth* uporabniki s kockami gradijo razne objekte v resničnem svetu. Pri tem nimajo nekega točno določenega cilja, ampak preprosto prek individualne ali skupne igre v resničnem svetu ali okolju, ki ga izdelajo, po prosti presoji ustvarjajo, gradijo in raziskujejo (Riordan in Scarf, 2017). Uporabnik lahko doma izdela pomanjšano različico stvaritve v razširjeni resničnosti, tako kot bi sestavljal legokocke, in jo nato postavi na prosto, kjer jo poveča na velikost v resničnem prostoru. Izdelani navidezni objekti so fiksni in postavljeni na izbrano lokacijo, kjer jih lahko vidijo drugi igralci, ki pridejo mimo, in jih tudi razstavijo in zgradijo na novo, če to želijo. *Minecraft Earth* je lahko prostor skupne igre, v katerem lahko več uporabnikov med seboj sodeluje in si pomaga pri ustvarjanju navideznih likov in objektov (Irving, 2019).

Pri igri *Minecraft Earth* lahko uporabnik s QR-kodo prijatelja povabi, da mu pomaga pri ustvarjanju. Prijatelji, ki so v bližini in imajo na pametnem telefonu nameščeno igro, lahko kodo skenirajo ter se pridružijo gradnji in sodelujejo z drugimi (Warren, 2019). Tako nastajajo skupnosti in skupine, ki skupaj ustvarjajo, kar kaže, da ima *Minecraft Earth* tudi družabni vidik (Riordan in Scarf, 2017). V tovrstnem digitalnem svetu lahko otroci z digitalnimi predstavitvami raznovrstnih materialov ustvarjajo različne stvari ter se pri tem igrajo, učijo in preizkušajo različne spretnosti v prostoru, s katerim se poistovetijo in ga vzamejo za svojega. Uporabniki lahko gradijo domiselne objekte, kot so stavbe, ulice, pločniki, mestni parki, mesta in pokrajine, ter celo prvine naravnega okolja, kot so drevesa in gozdovi. Podlaga navedenim stvaritvam so lahko resnični ali izmišljeni prostori, kar igralcem omogoča, da ustvarijo okolje, ki prikazuje mesto, pokrajino ali kateri koli drug kraj na Zemlji (de Andrade idr., 2020). Anketa med otroki, ki jo je novembra in decembra 2021 na svoji spletni strani izvedla organizacija Common Sense Media, je pokazala, da imajo otroci to igro radi, ker je zabavna in hkrati poučna, saj z njeno uporabo

razvijajo umetniške, ustvarjalne in motorične spretnosti, poleg tega je primerna za otroke vseh starosti (Common Sense Media, 2019).

EduPARK je igra lovljenja zakladov, ki temelji na razširjeni resničnosti in zagotavlja učno okolje, podprto z napredno tehnologijo. Podobna igra je tudi *Geocaching*, ki temelji na uporabi sprejemnika GPS in interneta ter uporabnikovega raziskovanja okolice. Pri tej visokotehnološki igri lovljenja zakladov uporabniki na neki lokaciji skrijejo zaklad (po navadi manjšo vodotesno škatlo) ter njegove koordinate skupaj z namigi objavijo na internetu (Mcnamara, 2004: 9). Igra vključuje kviz z vprašanji izbirnega tipa in vsebine, sestavljene iz slik, besedila in zvočnih posnetkov. Uporabnike spodbuja k temu, da obiščejo izbrane lokacije v parku in poiščejo oznake na tablah. Igra ima štiri faze, pri čemer se vsaka faza nanaša na drugo pot skozi park, na kateri morajo igralci na podlagi lokacije na zemljevidu odgovoriti na postavljena vprašanja izbirnega tipa (slika 1; Pombo in Marques, 2018). Omogoča tudi, da uporabniki raziskujejo park, ne da bi morali slediti oznakam za prikaz podatkov in učnega gradiva na podlagi razširjene resničnosti, kar jim omogoča še več priložnosti za učenje na kraju samem. Na koncu vsake faze igralci prejmejo namig, na podlagi katerega lahko najdejo navidezni zaklad. Če ga najdejo, so nagrajeni s točkami in navideznimi predmeti, ki jih lahko zamenjajo za pomoč pri vprašanjih. V anketi o uporabi opisane igre med otroki jih je 90,2 % navedlo, da jim aplikacija na podlagi prikaza virtualnih informacij v fizičnem svetu pomaga spoznavati okolico, 86,9 % pa jih je aplikacijo ocenilo kot uporaben pripomoček za učenje (Marques in Pombo, 2019).

Aplikacija *UrbanAR* z razširjeno resničnostjo ljudem med igro omogoča dostop do urbanističnega oblikovanja in izražanje mnenj o posameznih urbanističnih rešitvah. Občine lahko na podlagi podatkov in mnenj uporabnikov iz te aplikacije lažje zagotovijo, da so mesta oblikovana ali preoblikovana v skladu s potrebami in željami prebivalcev. Aplikacija torej omogoča, da mesto na podlagi sodelovanja postane boljši kraj za vse. V njej lahko uporabniki vizualno prikažejo svoje zamisli neposredno v fizičnem prostoru. O vseh stvaritvah nato glasujejo drugi uporabniki, kar spodbuja množično sodelovanje (slika 2; Dutch Design Daily, 2020; UrbanAR, 2021a). V anketi, ki so jo izvedli razvijalci aplikacije, so uporabniki navedli, da ni odvisna od njihove domišljije, saj lahko stvari že vidijo v fizičnem prostoru. Poleg tega jim aplikacija omogoča, da prikažejo svoje zamisli na zaslonu in vidijo, kako bi bilo najbolje razporediti posamezne grajene prvine v mestnem prostoru (UrbanAR, 2021b). Čeprav je aplikacija namenjena vsem starostnim skupinam, je zlasti primerna za otroke, ki z njo razvijajo vizualno pismenost in občutek odgovornosti do mesta, v katerem bodo še dolgo živeli.

Slika 1: a) posnetki zaslona, ki prikazujejo posamezne stopnje v aplikaciji in igri *EduPARK* (vir: Pombo in Marques, 2021); b) tabla ob drevesu z oznako za prikaz virtualnih informacij (vir: Pombo in Marques, 2017)
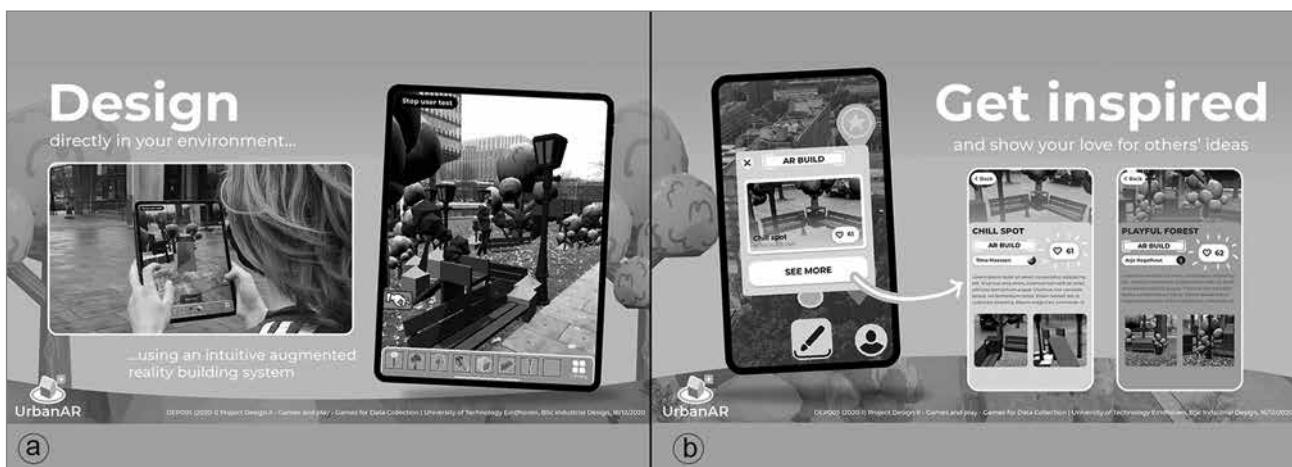
Slika 2: a) izbrani posnetki zaslona igre *UrbanAR* (vir. Dutch Design Daily, 2020); b) izmenjava zamisli z drugimi uporabniki (vir: Dutch Design Daily, 2020)

Preglednica 1: Proučevane aplikacije in njihove značilnosti

	Priložnosti, ki jih omogoča razširjena resničnost (digitalni in resnični svet)	Značilnosti otrokom prijaznega mesta
Minecraft Earth	Spodbujanje sodelovanja med otroki	Oblikovanje skupnosti in skupin, ki skupaj ustvarjajo in uporabljajo ustvarjene prvine.
	Spodbujanje otrokovih socialnih veščin na podlagi izmenjave zamisli in sodelovanja v ustvarjalnih procesih	
EduPARK	Učenje o izbranem prostoru v digitalnem in resničnem svetu	Poučnost
	Razvoj čutov otrok (tipa, vida in sluha), da lahko zaznavajo več od tega, kar je trenutno v resničnem svetu.	Dostop do zelenih površin
UrbanAR	Uporabniki svoje zamisli prikažejo na zaslonu in vidijo, kako so umeščene v resnični prostor.	Odločitve ljudi vplivajo na načrtovanje in urejanje mesta.
	Kolektivno sodelovanje pri urbanističnem oblikovanju	Ljudje povejo, katere grajene prvine so jim všeč

Vir: avtorja (2022)

V preglednici 1 so predstavljene aplikacije analizirane z vidika priložnosti, ki jih omogoča razširjena resničnost, in značilnosti otrokom prijaznih mest. Pri analizi značilnosti posameznih aplikacij sta avtorja upoštevala aktivnost otrok in njihovo interakcijo z okoljem med uporabo aplikacije. Navedene značilnosti sta povzela iz člankov in spletnih strani razvijalcev iger, ki so v članku tudi citirani.

Kot je razvidno iz preglednice 1, igre otrokom prinašajo različne koristi. Z uporabo razširjene resničnosti v igri *Minecraft Earth* se skupaj igrajo v digitalnem in resničnem svetu ter pri tem razvijajo socialne veščine. Hkrati se na igralni platformi sporazumevajo z drugimi in izboljšujejo svojo sposobnost dela v ekipi. Pri igri *EduPark* lahko izkusijo razširjeno resničnost v različnih oblikah (v obliki besedila, videa in 3D-modelov), kar spodbuja razvoj njihovih čutov (tipa, vida in sluha) v res-

ničnem in digitalnem svetu. Z aplikacijo *UrbanAR* pa lahko uporabniki izražajo svoja mnenja v celotnem procesu urbanističnega oblikovanja in ugotovijo, kako bi bile njihove stvaritve videti v resničnem prostoru. Aplikacija poleg tega uporabnikom omogoča, da komentirajo delo drugih uporabnikov in drug drugemu pomagajo izboljšati svoje stvaritve.

Pri vseh treh aplikacijah je razvidno tudi to, da omogočajo nekatere vidike otrokom prijaznega mesta. Pri igri *Minecraft Earth* se otroci družijo in igrajo z vrstniki. Aplikacija *Edu-PARK* je namenjena uporabi v mestnem parku, s čimer spodbuja uporabo novih oblik učenja naravoslovnih vsebin in prek izkušenj v resničnem okolju izboljša razumevanje ekosistemov (Pombo in Marques, 2020: 2). V aplikaciji *UrbanAR* pa lahko otroci sodelujejo pri urejanju svojega mesta, svoje zamisli uresničijo v obliki digitalnih predstavitev in sodelujejo pri odločanju glede podobe svojega mesta.

5 Sklep

Razširjena resničnost omogoča razvoj otrokovih spretnosti. Spodbuja razvoj raziskovalnega učenja, prostorskih predstav in praktičnih spretnosti ter ustvarja hibridna učna okolja, ki združujejo digitalne in resnične predmete. S tem lahko izboljša otrokovo sposobnost reševanja problemov, sporazumevanja in kritičnega razmišljanja. Glede na to, da že od mladosti uporabljajo take digitalne tehnologije in se doma zabavajo z raznimi napravami, so lahko današnji otroci z uporabo razširjene resničnosti bolj prisotni tudi na odprtem mestnem prostoru, kjer lahko s fizično aktivnostjo razvijajo spretnosti. Razširjena resničnost je lahko vmesnik, ki povezuje resnični in digitalni svet ter pomaga ustvarjati otrokom prijazna mesta.

Pregled literature in analiza izbranih primerov sta pokazala, da lahko mesta z uporabo razširjene resničnosti postanejo še prijaznejša otrokom, saj jih lahko tovrstna tehnologija spodbudi k temu, da so bolj aktivno prisotni na mestnem prostoru. V prihodnje bi bilo treba od otrok po svetu pridobiti še več povratnih informacij o njihovih izkušnjah z uporabo te tehnologije v mestih, da bi lahko natančneje opredelili in primerjali vlogo razširjene resničnosti v otrokom prijaznem mestu.

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Obnova postsocialistične mestne identitete: primer Novega Pazarja v Srbiji

Avtorice se v skladu s sodobno mestno politiko, katere cilj je oblikovati konkurenčno mestno identiteto, v članku ukvarjajo s postsocialistično identiteto Novega Pazarja, srednje velikega mesta na jugozahodu Srbije. Proučujejo oblikovanje mestne identitete na podlagi dinamične interakcije med akterji in družbeno-prostorskimi strukturami, pri čemer uporabljajo pojem mestnega habitusa, ki temelji na Bourdieujevi teoriji o habitusu, in Lefebvrov koncept družbene produkcije prostora. Posebno pozornost namenjajo izzivom, s katerimi se postsocialistična mesta spopadajo pri ponovnem vzpostavljanju svoje identitete po obdobju spodbujanja modela socialističnega (industrijskega) mesta in njegovem poznejšem zatonu.

Njihova analiza temelji na anketi med prebivalci Novega Pazarja (n = 299), intervjujih s strokovnjaki, zaposlenimi v mestni upravi ter drugih lokalnih ustanovah in organizacijah (n = 14), in na vsebinski analizi uradnega spletišča mesta. Njihovi izsledki kažejo, da je Novi Pazar mesto z močno identiteto, a tudi precejšnjimi strukturnimi omejitvami, ki onemogočajo lokalno delovanje, na podlagi katerega bi lahko mesto izkoristilo svoj potencial za oblikovanje konkurenčne identitete.

Ključne besede: identiteta, postsocialistično mesto, habitus, Novi Pazar, Srbija

1 Uvod

Zaradi današnje neoliberalne, podjetniške in neoendogene mestne politike je potrebno nenehno tekmovanje med mesti na podlagi njihovih lokalnih posebnosti, zaradi česar je oblikovanje mestne identitete kot razvojnega vira postalo strateško pomembna točka politike mest (Campelo, 2015). Avtorice se v članku osredotočajo zlasti na postsocialistična mesta, ki se pri obnovi svoje identitete srečujejo s prav posebnimi izzivi. Vzrok za to je njihova podedovana identiteta socialističnega industrijskega mesta, v katerem so bili lokalni viri in zlasti tradicionalna ali predsocialistična mestna identiteta zapostavljeni, zaradi česar je mestom grozilo, da bodo izgubila svojo pristnost (Dragićević-Šešić, 2011). Kaos, ki spremlja postsocialistično preobrazbo, dodatno slabi sposobnost lokalnih akterjev, da ustvarjalno ovrednotijo lokalne vire ter obnovijo in razširijo identiteto svojega mesta kot razvojnega vira. Na Balkanu in še zlasti v Srbiji je bilo omenjeni temi do zdaj posvečenih razmeroma malo raziskav (Vujošević idr., 2010; Jovanović, 2013; Spasić in Backović, 2017; Petrović in Toković, 2018; Troch in Janssens, 2019; Bogdanović, 2020), v katerih so se raziskovalci v glavnem osredotočali na večja ali glavna mesta (Bursać, 2009; Neđučin idr., 2014; Doytchinov idr., 2015; Aranđelović idr., 2017; Camprag in Suri, 2019; Spasić in Backović, 2020). Avtorice želijo z obravnavo Novega Pazarja kot srednje velikega mesta v jugozahodni Srbiji zapolniti navedeno vrzel.

Najprej so predstavile raziskovalna izhodišča, vključno s predpostavko, da dinamična interakcija med akterji in družbeno-prostorskimi strukturami omogoča ustvarjanje mestne identitete, ki lahko poteka v obliki spontanega dolgotrajnega procesa ali pa strateško načrtovane dejavnosti. Pri tem so uporabile pojem mestni habitus, ki temelji na Bourdieujevi teoriji o habitusu, in Lefebvrov koncept družbene produkcije prostora. Nato so izpostavile nekatere pomembne kontekstualne značilnosti oblikovanja identitete postsocialističnih mest na splošno in tistih v Srbiji. Nadaljevanje se osredotoča na analizo identitete Novega Pazarja na podlagi podatkov, zbranih z intervjuji, anketo, ki jo je leta 2013 izvedel Inštitut za sociološke raziskave Univerze v Beogradu, in vsebinsko analizo uradnega spletišča mesta, ki so jo avtorice opravile med marcem 2017 in marcem 2018. V sklepu so predstavljeni zaznani potenciali in ovire za oblikovanje konkurenčne identitete Novega Pazarja.

2 Raziskovalna izhodišča

2.1 Obnova identitete mesta: spontan proces in strateško načrtovana dejavnost

Avtorice proučujejo oblikovanje mestne identitete kot posebnega razvojnega vira tako, da se osredotočajo na interakcijo med akterji in družbeno-prostorskimi strukturami. Oblikovanje mestne identitete razumejo kot dolgotrajen in zapleten proces, na katerega nenehno vplivajo tako objektivne kot subjektivne spremembe resničnega stanja na terenu (Lynch, 1960; Norberg-Schulz 1979; Neill, 2003; Butina-Watson in Bentley 2007; Houghton in Stevens, 2010; Nas idr., 2011; Kavaratzis idr., 2015). Hkrati je oblikovanje konkurenčne identitete mesta (Anholt, 2007) strateško načrtovana dejavnost, pri kateri so pomembne tako (zgodovinsko razvite) materialne ali objektivne značilnosti mesta kot pomeni, občutja in pričakovanja, ki jih imajo ljudje v povezavi s svojim mestom (Kotler idr., 1999).

V skladu z idejo o povezovanju notranje razvojne dinamike posameznega območja z značilnimi normami lokalne skupnosti, ki živi na zadevnem območju (Storper 1997; Moulaert in Sekia, 2003), oblikovanje mestne identitete izhaja iz tega, da vsako mesto na podlagi stalne interakcije med družbeno-prostorskimi strukturami in delovanjem lokalnih akterjev ustvari svojo miselno matrico (Moulaert in Sekia, 2003; Bell in de-Shalit, 2011). Poleg omenjene matrice lokalni akterji razvijejo svoj pogled na trenutno stanje in na to, kako bi bilo treba stvari narediti (Low, 2012: 321). S tega vidika vsako mesto tvori svojevrsten zgodovinski in prostorski kontekst posebnega znanja in izkušenj (Spasić in Backović, 2017) ali, v skladu z Bourdieujevo teorijo, vsako mesto ima svoj habitus (Bourdieu, 1999). Mestni habitus se v urbani sociologiji razume kot razmeroma stabilen in lokaliziran vzorec vedenj, ki daje lokalnim akterjem praktične kompetence v njihovi neposredni okolici v skladu s strukturnimi priložnostmi na ključnih socialnih področjih (stanovanja, delo, izobraževanje, kultura in potrošništvo) v posameznem mestu (Savage idr., 2005).

Uporaba koncepta mestnega habitusa pri razumevanju oblikovanja mestne identitete kot spontanega dolgotrajnega procesa in strateško načrtovane dejavnosti je pomembna z več vidikov. Svet mest je zelo dinamičen in ni nujno, da za vsakogar pomeni isto. V nasprotju s tem mestni habitus ustvarja enake ali podobne pomene in asociacije pri številnih ljudeh. Zadosti jasne in pozitivne predstave prebivalcev o tem, kaj dela njihovo mesto prepoznavno in privlačno tako za njih kot za morebitne vlagatelje in obiskovalce, so namreč pomemben temeljni pogoj za oblikovanje konkurenčne mestne identitete (Anholt, 2010). Mestni habitus se poleg tega dojema kot utelešenje zgodovine ali kot aktivna sedanjost celotne preteklosti, katere produkt je (Siisiainen, 2000). V tem smislu deluje kot nakopičen kolektivni spomin, ki vpliva na sposobnost lokalnih akterjev, da ustvarjalno ovrednotijo mestne vire in strateško zgradijo identiteto mesta kot razvojni vir (Campelo, 2015).

Oblikovanje identitete kot relacijska kategorija vključuje primerjave (Jenkins, 1996) – v primeru mestne identitete primerjave s strukturnimi priložnostmi drugih mest. Na zunanje

identitetne odnose med »nami« in »drugimi«, zlasti pa na odnose z glavnim mestom in drugimi upravnimi ravnmi (regionalnimi ali državnimi), vpliva tudi mestni habitus. Kot navaja Bourdieu, se družbena realnost spontano pretvori v fizični ali naravni prostor, ki pomembno prispeva k naturalizaciji socialnih razlik. Če je glavno mesto kraj, na katerem so zgoščeni najkakovostnejši viri, gre pri njegovem odnosu do drugih (perifernih) mest za osnovno razmerje neenakosti (Bourdieu, 1999; Savage idr., 2005). Habitus perifernega mesta izraža to, kako njegovi prebivalci dojemajo, kaj je mogoče in nemogoče ali normalno in nenormalno za ljudi, kot so oni, kar zmanjšuje njihovo ustvarjalnost, samoiniciativnost in samozavest. Z drugimi besedami, lokalno vzdušje v manjših mestih, ki ga zaznamujeta pasivnost in apatija kot posledica majhne avtonomije lokalnih akterjev zaradi centraliziranih modelov odločanja, je ena izmed negativnih značilnosti njihovega habitusa, ki vpliva na sposobnost lokalnih akterjev, da izkoristijo mestne vire in obnovijo mestno identiteto kot razvojni vir (Campelo, 2015).

Ker na področju mestne politike na obnovo mestne identitete močno vplivajo akterji, ki imajo moč, da prednostno razvrščajo vrednote (Anholt, 2010), avtorice uporabijo tudi Lefebvrov triadni koncept družbene produkcije prostora (Lefebvre, 1991). S tega vidika ima pri oblikovanju konkurenčne mestne identitete ključno vlogo reprezentacija prostora (strategije, dokumenti, načrti in spletišča vladajočih ustanov), ki utemeljuje pogled na mesto, skladen z interesi tistih na oblasti. Navedeno precej skrči obseg spontanega oblikovanja mestne identitete, kar po Lefebvru ne izraža samo reprezentacije prostora, ampak tudi prostorske prakse, ki so del vsakdanjega življenja, in prostor reprezentacije, ki se uporablja za domiselno nasprotovanje aktualnim strukturam. S strateško vnovično opredelitvijo mestne identitete torej ne moremo doseči njene potrebne pristnosti, če pri tem ne upoštevamo spontanih značilnosti identitete mesta. Za doseganje te pristnosti so potrebni skupni pristop k upravljanju mesta, zaupljiv odnos, participativna načela in ocena mnenj lokalnih akterjev, katerih notranje razlike (npr. socialne, ekonomske, politične in etnične) ne bi smele biti razlog za nesoglasja glede identitete (Anholt, 2010; Kavaratzis, 2010). Med akterji se najpogosteje omenjajo uslužbenci v mestni upravi in raznih drugih ustanovah, prebivalci, lokalne interesne skupine, podjetniki in njihova združenja, gospodarske zbornice ipd. (Kavaratzis idr., 2015). V praksi so prebivalci pogosto zapostavljeni, ob tem tudi ni dovolj raziskav o njihovem vedenju in pričakovanjih (Kotler idr., 1999; Insch in Florek, 2008; Bell in de-Shalit, 2011; Brabazon, 2014). Raziskava, predstavljena v tem članku, se osredotoča na poglede prebivalcev Novega Pazarja, tako laikov kot strokovnjakov.

2.2 Posebnosti postsocialističnih mest

V socializmu je mestom grozilo, da bodo zaradi ideje o socialističnem industrijskem mestu, ki se je spodbujala na podlagi modela od zgoraj navzdol, izgubila svojo pristnost (Dragićević-Šešić, 2011). Po drugi strani je tudi postsocialistično obdobje zlasti manjšim in bolj obrobnim (večinoma industrijskim) mestom prineslo nove izzive. Spopadajo se s posledicami tehnološkega propadanja, neustrezno ali zanemarjeno infrastrukturo, čedalje slabše izobraženo delovno silo in odseljevanjem mladih (Jaššo in Finka, 2010; Domanski, 2011; Kiss, 2011). Skupaj z izginotjem industrijskih blagovnih znamk, po katerih so bila nekoč znana srednje velika in mala mesta, je vse našteto zamajalo temelje njihove industrijske identitete. Po drugi strani habitus industrijskega mesta, ki so ga ta mesta razvila v obdobju socializma, lokalne akterje pogosto omejuje pri premišljevanju o razvojnih možnostih, kar podžiga kolektivni fatalizem in apatijo. Poleg tega slabo razvita kultura participativnega upravljanja (Tsenkova in Nedović Budić, 2006; Stanilov, 2007; Ferenčuhová in Gentile, 2016) kot še en primer socialistične dediščine krepi habitus perifernega mesta in slabi sposobnost preoblikovanja mestne identitete.

Na ravni reprezentacije prostora se daje prednost upravičevanju novih smeri gospodarskega in političnega razvoja mesta, pri čemer se posebna pozornost namenja poskusom obuditve gospodarske dinamičnosti iz predsocialističnega obdobja in prikazovanju postsocialističnega obdobja kot obdobja oživitve podjetniškega duha, ki je bil med socializmom potlačen. Navedeno lahko razumemo tudi kot izraz habitusa perifernega mesta v zunanjih (mednarodnih) identitetnih odnosih, pri katerih se mesta počutijo obremenjena z dediščino socializma, ki jo pogosto predstavljajo kot zgodovinski odklon, odmik od prave poti in zgodovinsko napako, ki bi jo bilo treba pozabiti (Adler, 2005; Young in Kaczmarek, 2008).

Srbska mesta se pri vnovični opredelitvi svoje identitete spopadajo z velikimi izzivi, z večino katerih se srečujejo tudi druga postsocialistična mesta, v primeru Srbije pa so ti zaradi specifičnih družbenih okoliščin še toliko večji. Prvič, zaradi dolgotrajne in zahtevne postsocialistične preobrazbe, ki je sovpadala z vojnami po razpadu Jugoslavije, gospodarsko prestrukturiranje in privabljanje novih (neposrednih tujih) naložb poteka zelo počasi, kar povzroča močan upad industrijske proizvodnje in propad mnogih industrijskih mest oziroma mest, v katerih prevladuje samo ena industrijska panoga (Vujošević idr., 2010). Drugič, razvojni razkorak med Beogradom kot glavnim mestom in drugimi mesti se čedalje bolj veča (Molnar, 2013), zaradi česar mnoga mesta ostajajo ali postajajo periferna (Stojković, 2009). Tretjič, zaradi močno centraliziranega modela odločanja Srbijo bremenita nesposobna lokalna uprava in slabo

razvita komunikacija med javnim, zasebnim in civilnim sektorjem (Vujović in Petrović, 2007; Vujošević idr., 2010; Petrović in Toković, 2016, 2018).

Novi Pazar se spopada z večino zgoraj omenjenih izzivov, povezanih z vnovično opredelitvijo identitete postsocialističnih mest, in z izzivi, ki izhajajo iz posebnih okoliščin srbske družbe. Čeprav se uvršča med funkcionalna urbana območja nacionalnega pomena (Šećerov in Nevenić, 2009), so strukturne priložnosti v mestu precej omejene. Mesto namreč vse od vzpostavitve novih državnih mej ostaja odrezano od glavnih državnih in mednarodnih prometnih koridorjev. Poleg tega se spopada z velikimi gospodarskimi težavami; njegova stopnja gospodarskega razvoja znaša med 60 in 80 % državnega povprečja, zaradi česar spada med slabo razvita lokalna upravna območja (Regionalni razvoj, 2014), za katera je značilno močno gospodarsko (industrijsko) nazadovanje. Novi Pazar je tudi eno izmed redkih mest v državi, v katerih število prebivalcev raste, zaradi česar mora mesto stalno povečevati svoje naložbe v infrastrukturo. Čeprav se spopada z velikimi gospodarskimi težavami in ima pomanjkljivo infrastrukturo, je med območji, na katerih živi največ Bošnjakov v Srbiji. Glede na njegove precej omejene strukturne priložnosti avtorice predpostavljajo, da njegov habitus negativno vpliva na to, kako lokalni akterji dojemajo identiteto mesta. Negativni vpliv imata zlasti habitus industrijskega mesta zaradi nazadovanja gospodarstva oziroma industrije in habitus perifernega mesta (v primerjavi z glavnim mestom in drugimi srbskimi mesti) zaradi prostorske marginalizacije in centraliziranega modela upravljanja.

3 Metode in cilji analize

Pri proučevanju (pre)oblikovanja identitete Novega Pazarja so avtorice analizirale tako vidik spontanega dolgoročnega procesa kot vidik strateških prizadevanj v okviru mestne politike. V ta namen so podatke zbrale z anketo med mestnimi prebivalci (*n* = 299) in intervjuji (*n* =14) s strokovnjaki, zaposlenimi v službah mestne uprave (zlasti tistih, ki se ukvarjajo z gospodarskimi, kulturnimi in socialnimi vprašanji), ključnih lokalnih ustanovah (gospodarski zbornici in kulturnih ustanovah) in nevladnih organizacijah, ki so z mestno upravo sodelovale pri razvoju projektov v mestu. Čeprav na obe skupini akterjev spontano vpliva mestni habitus, zaznave strokovnjakov vključujejo tudi strateško pojmovanje (reprezentacijo) mestne identitete. Avtorice so reprezentacijo prostora proučile še z vsebinsko analizo uradnega spletišča mesta.

Ob predpostavki, da je identiteta mesta močnejša, če njegov habitus vzbuja enake ali podobne pozitivne pomene med prebivalci, je bil prvi cilj analize pridobiti vpogled v značilnosti identitete Novega Pazarja na podlagi tega, kako anketiranci

zaznavajo mestne znamenitosti in prepoznavne mestne simbole ter kaj menijo o tem, kako mesto dojemajo drugi prebivalci Srbije. Pri tem avtorice proučujejo morebitne negativne vplive omejenih strukturnih priložnosti v mestu na zaznave anketirancev in razlike v njihovih mnenjih glede na etnično pripadnost, starost, izobrazbo in druge socialno-demografske značilnosti. Nato so se osredotočile na analizo oblikovanja konkurenčne identitete mesta, pri čemer so upoštevale vpliv mestnega habitusa na to, kako prebivalci dojemajo splošne razmere v mestu, in to, kako bi bilo treba stvari v njem narediti. Ob tem ugotavljajo, kako močno habitus industrijskega oziroma perifernega mesta zavira oblikovanje identitete Novega Pazarja. Na koncu so analizirale še vsebino uradnega spletišča mesta, da bi ugotovile, ali se predstavljeni označevalci mestne identitete ujemajo s tistimi, o katerih poročajo anketiranci; tovrstno ujemanje je nekakšen temeljni pogoj, da bi dosegli potrebno pristnosti mestne identitete. Poleg tega so analizirale raven komunikacije med nosilci spletišča in javnostjo (prebivalci ter turisti in vlagatelji).

3.1 Spontano soglasje glede ključnih označevalcev identitete

V tem poglavju so avtorice analizirale identiteto Novega Pazarja na podlagi tega, kako anketiranci zaznavajo mestne znamenitosti in prepoznavne mestne simbole ter kaj menijo o tem, kako mesto dojemajo drugi v Srbiji. Proučile so, ali habitus Novega Pazarja pri prebivalcih vzbuja pozitivne asociacije ter enake ali podobne pomene, kar je temeljni pogoj za oblikovanje močne mestne identitete. Njihova analiza temelji na vprašanjih, ki so jih zastavile v anketi in intervjujih ter so bila v obeh primerih enaka. Ključne označevalce identitete mesta so razdelile v štiri skupine: 1. prepoznavne znamenitosti, 2. mestni simboli, 3. značilnosti mestnih prebivalcev in 4. mnenja zunanjih akterjev o mestu. Anketna vprašanja, povezana z naštetimi označevalci, so bila odprtega tipa. Avtorice so odgovore najprej kodirale, nato pa so podatke obdelale v statističnem programu SPSS, pri čemer so se oprle na opisno statistično analizo. Enak način kodiranja so uporabile tudi pri prepisih intervjujev. Kvalitativne podatke so obdelale v programu Maxqda. Po ločeni analizi kvantitativnih in kvalitativnih podatkov so analizirale še ujemanje odgovorov anketirancev in intervjuvanih strokovnjakov, s čimer so želele ugotoviti stopnjo ujemanja pri njihovem dojemanju identitete Novega Pazarja.

Novi Pazar ima bogato zgodovino, ki sega v obdobje srednjeveške srbske države in Otomanskega cesarstva, njegova multietnična in večverska dediščina pa je z vidika identitete velikega pomena tako za Srbe kot Bošnjake. Zato ni presenetljivo, da so tako anketiranci kot intervjuvanci med označevalci identitete in/ali simboli svojega mesta omenjali zlasti kulturne in
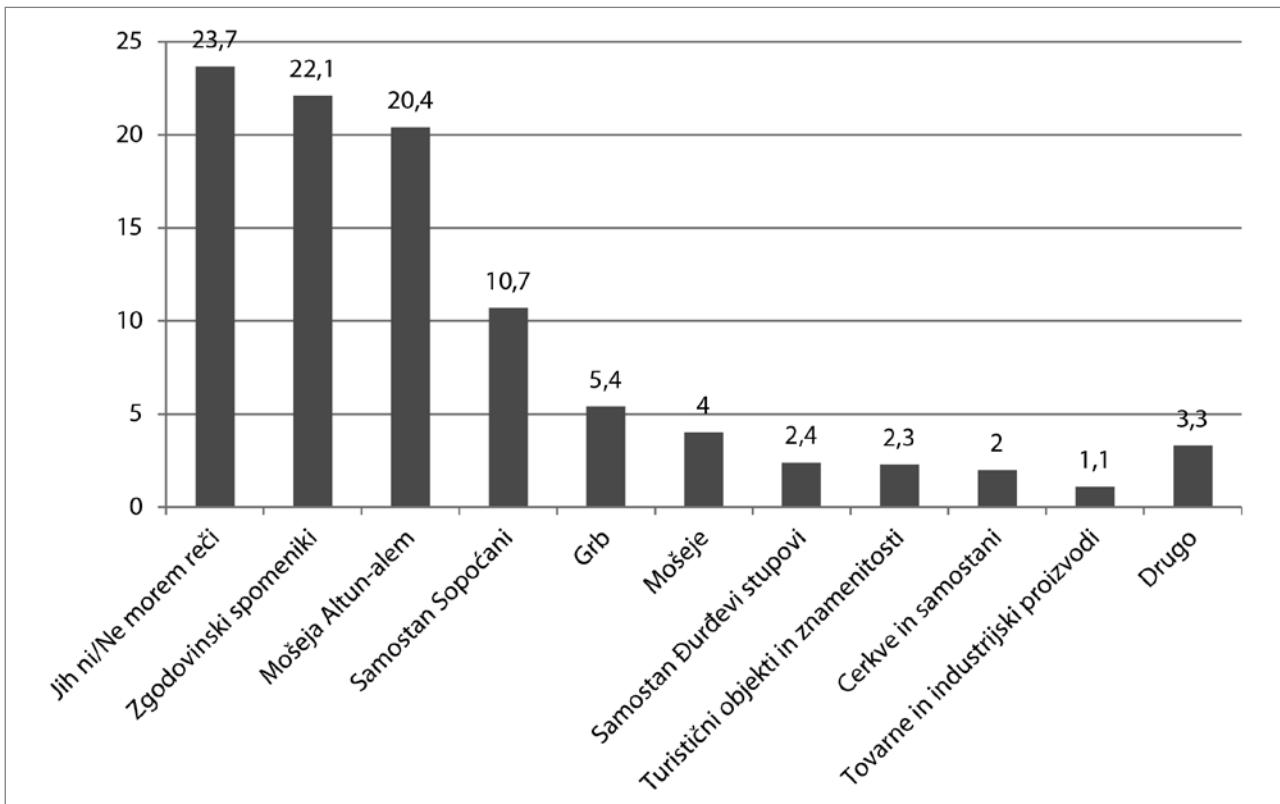
Slika 1: Mestni simboli (ilustracija: avtorice)

Slika 2: Mošeja Antul-alem (vir: Matematični inštitut Srbske akademije znanosti in umetnosti, 2022)

Slika 3: Samostan Sopoćani (foto: Irena Petrović)

zgodovinske znamenitosti. V anketi je bilo med omenjenimi simboli 40 % verskih znamenitosti, posvetne objekte pa je omenilo 22 % anketirancev. Analiza intervjujev s strokovnjaki je pokazala ujemanje z odgovori anketirancev pri izboru vrste znamenitosti in navedbi posameznih objektov: »Trdnjava Bedem je vsekakor simbol mesta, Bedem in stražarski stolp Kula Motrilja« (intervjuvanec 7), »Imamo mošeje, kot je mošeja Altun-alem, potem cerkev sv. Petra, samostana Sopoćani in Đurđevi stupovi, vse to so simboli, ki so nekako značilni za to mesto« (intervjuvanec 11).
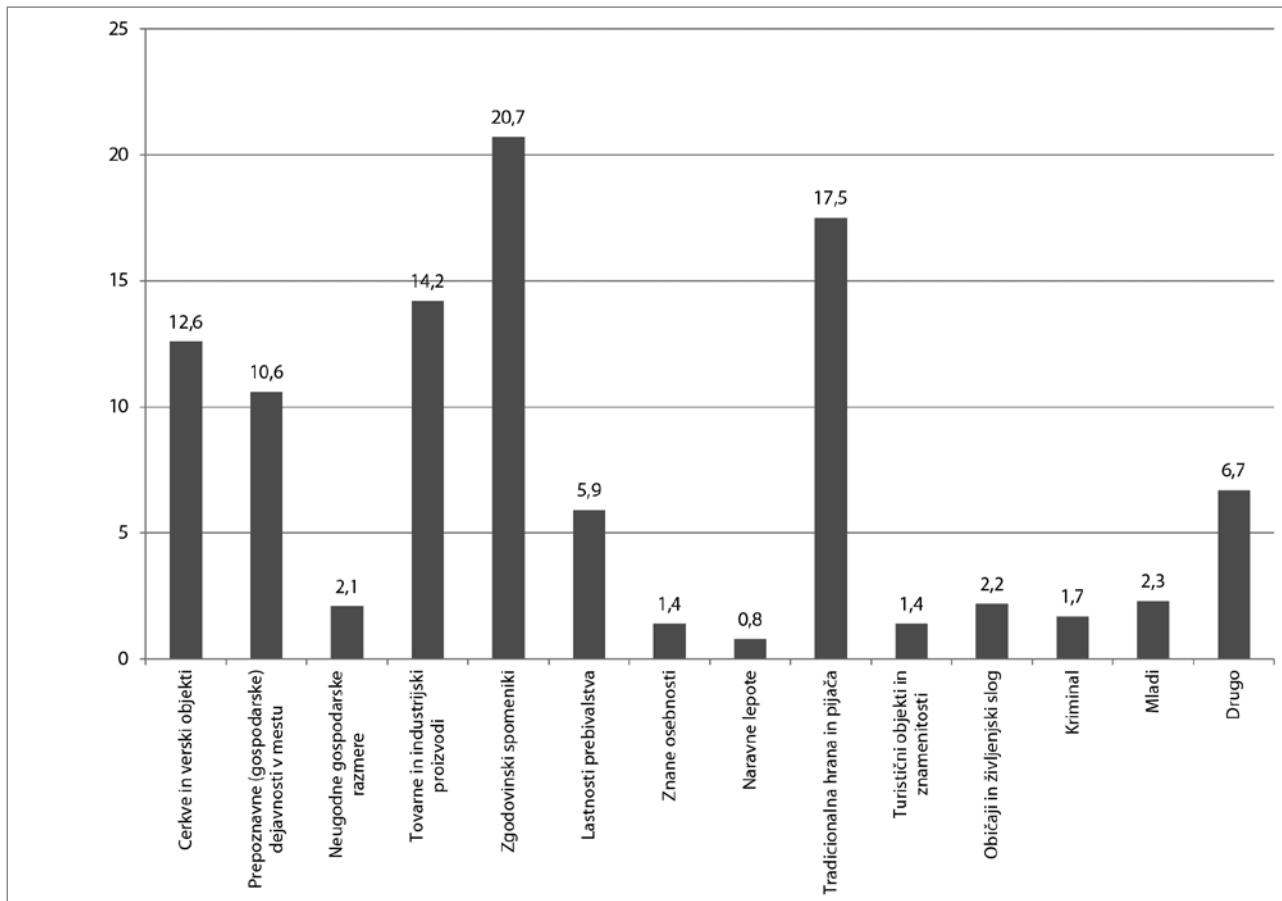
Slika 4: Dejavniki prepoznavnosti mesta (ilustracija: avtorice)
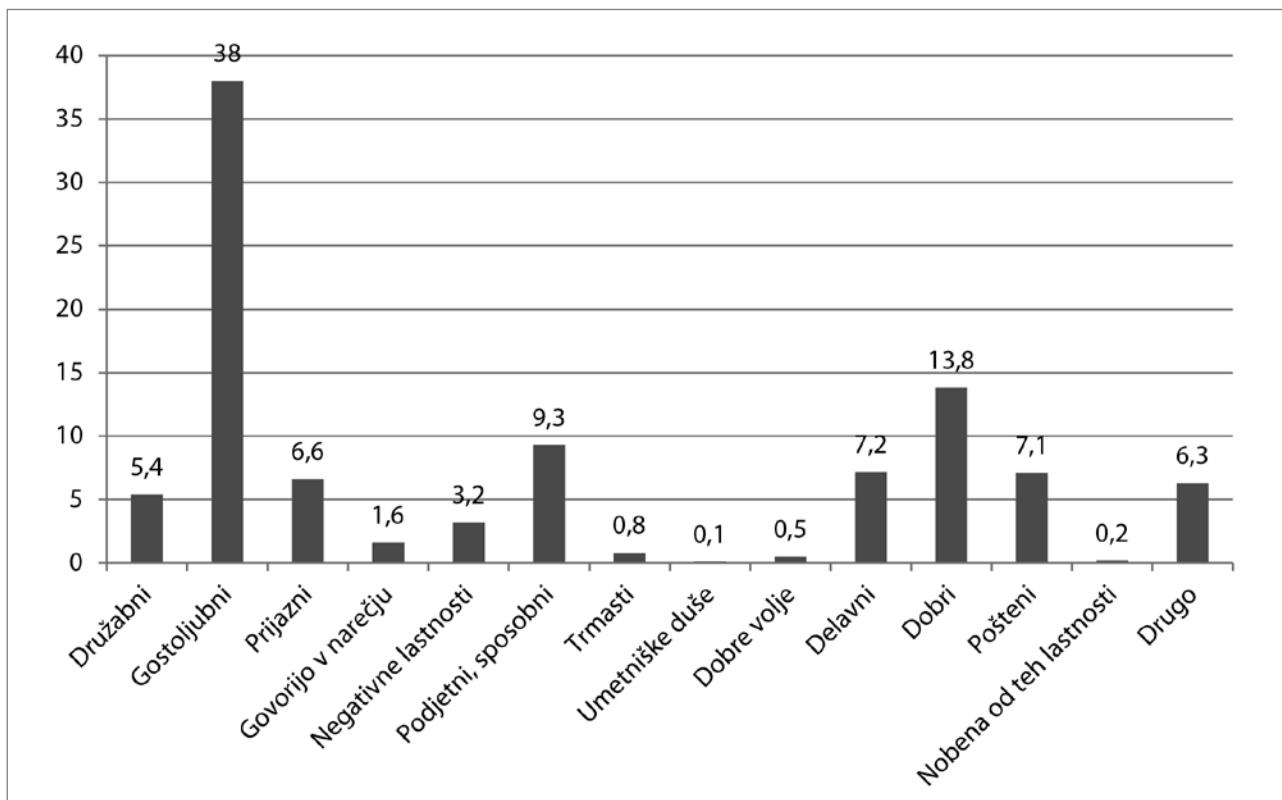
Slika 5: Lastnosti mestnih prebivalcev (ilustracija: avtorice)

Anketiranci so med drugimi označevalci identitete mesta in njegovih simbolov omenjali tradicionalno hrano in pijačo (zlasti čevapčiče in mantije, 17 %), tovarne in proizvode (zlasti kavbojke, 14,2 %) in značilne gospodarske dejavnosti (zlasti trgovino, 10,6 %), s čimer so preusmerili pozornost z materialnega na vedenjski simbolizem (Nas idr., 2011; Spasić in Backović, 2017). Zadnjenavedeni je postal zlasti opazen pri odgovorih na vprašanja o lastnostih prebivalcev Novega Pazarja, pri katerih je kar 38 % vseh anketirancev omenilo gostoljubje. Tudi strokovnjaki so v intervjujih izpostavili tovrstne lastnosti in jih opisali kot vidike medosebnih odnosov, ki odsevajo mestni habitus, ki spodbuja harmonične odnose, in prevlado pozitivnih asociacij, povezanih z identiteto mesta: »Odnosi med ljudmi v Novem Pazarju so malo posebni, ljudje so drug z drugim odkriti in med njimi vlada toplo vzdušje« (intervjuvanec 4).

Podobno je mogoče sklepati tudi glede materialnega simbolizma izbranih označevalcev mestne identitete, prek katerih so anketiranci posredno poudarili večstoletno sobivanje dveh verskih in etničnih skupin v mestu, čeprav jih je manj kot 1 % navedlo, da je Novi Pazar znan po mešanem prebivalstvu. V intervjujih so strokovnjaki kot pomemben vidik mestne identitete izpostavili večkulturnost mesta: »Ta večkulturna skupnost je zelo posebna, saj so v njej na enem mestu zbrani spomeniki dveh popolnoma različnih kultur« (intervjuvanec 7).

Prevladujoče pozitivne asociacije, povezane z identiteto mesta in njegovih prebivalcev, kot so gostoljubje, trgovska žilica ali večetničnost, se navezujejo na zgodovinski habitus trgovskega mesta in njegov vpliv na oblikovaje podjetniških veščin prebivalcev. Navedene lastnosti so bile ključne tudi za premagovanje notranjih nesoglasij med vojno v 90. letih prejšnjega stoletja: »Veste, ni pomembno, kako posebni in smešni se prebivalci Novega Pazarja zdimo, ko pridejo težki časi in se moraš odločiti, ali je bolje iti v vojno ali trgovati, je vedno bolje trgovati, saj smo trgovci. Pazar je večetnično mesto in nehajmo se pretvarjati, odnosi med Srbi in Bošnjaki niso idealni. Vendar smo ponosni, da nas v najtežjih časih, med vojno v Bosni v 90. letih, ta vojna ni prizadela, ker se nam je uspelo izogniti spopadom (kar je bila želja obeh strani). Mestu se je uspelo obdržati« (intervjuvanec 9).

Izkazalo se je, da omejene strukturne priložnosti v Novem Pazarju nimajo pomembnega vpliva na to, kako anketiranci dojemajo identiteto mesta. Edina negativna konotacija je bila povezana z dejstvom, da je Novi Pazar eno izmed srbskih mest z najmlajšim prebivalstvom. Na splošno je le malo anketirancev (samo 2,3 %) navedlo, da je mesto znano po mladih, v intervjujih pa je bilo to izpostavljeno hkrati kot pozitivna značilnost mesta in težava: »To vidim kot največjo in najtežjo oviro, ker imamo ogromno mladih ljudi ... in potem imaš vsako leto tisoč

Preglednica 1: Kakšno mnenje imajo o vašem mestu drugi prebivalci Srbije?

Mnenje	Delež (v %)
Večinoma pozitivno	32,1
Večinoma negativno	36,3
Niti pozitivno niti negativno	19,0
Ne vem	12,6
Skupaj	100,0

Vir: avtorice

novih brezposelnih, tako da je to, da je Pazar mlado mesto, pomembno, hkrati pa otežuje vse skupaj« (intervjuvance 6).

Analiza je pokazala, da spol, starost, izobrazba, poklic, finančni položaj in etnični izvor nimajo posebnega vpliva na razumevanje obravnavanih vidikov identitete Novega Pazarja. Zato se zdi, da kljub etničnim, kulturnim in drugim socialnim razlikam habitus Novega Pazarja med prebivalci ustvarja podobne pomene in asociacije v zvezi z mestom. Izsledki poleg tega nakazujejo, da imajo anketiranci dovolj jasno predstavo, po čem je Novi Pazar prepoznaven in privlačen, kar je dobro izhodišče za oblikovanje njegove konkurenčne identitete. Kljub temu več kot tretjina anketirancev meni, da drugi večinoma negativno vidijo njihovo mesto. To kaže vpliv habitusa perifernega mesta na dojemanje mestne identitete z vidika zunanjih odnosov (primerjave z drugimi srbskimi mesti).

3.2 Ovire za strateško oblikovanje mestne identitete

To poglavje se osredotoča na vprašanja, iz odgovorov na katera je mogoče razbrati, ali habitus industrijskega oziroma perifernega mesta ovira oblikovanje konkurenčne identitete Novega Pazarja. Vprašanja se nanašajo se na to, kako prebivalci zaznavajo trenutne razmere v mestu na splošno in v primerjavi z drugimi mesti, kako bi bilo treba po njihovem mnenju stvari v mestu narediti ter kaj menijo o razvojnem potencialu mesta in ključnih ovirah za njegov razvoj. Navedena vprašanja se torej osredotočajo na obnovo konkurenčne identitete mesta kot strateške dejavnosti in so bila zastavljena samo strokovnjakom v intervjujih. Avtorice so konkurenčno identiteto mesta razdelile na naslednje razsežnosti: 1. razvojni potenciali mesta, 2. notranje ovire za razvoj mesta, 3. zunanje ovire za razvoj mesta, 4. strukturne ovire za razvoj mesta in 5. ovire pri akterjih za razvoj mesta. Kvalitativni podatki so bili na podlagi navedenih razsežnosti kodirani v programu Maxqda.

V skladu z že izpostavljenim podjetništvom prebivalcev kot enim od označevalcev identitete mesta so intervjuvanci lokalno podjetništvo skoraj soglasno navedli kot ključni razvojni potencial Novega Pazarja. Kljub prisilni uvedbi industrije v mestu

med socializmom menijo, da habitus industrijskega mesta danes ni samo oslabel, ampak se v Novem Pazarju sploh nikoli ni uveljavil. Zato intervjuvanci v tem pogledu ne občutijo nikakršne izgube. Poleg tega niso izpostavili nobenega industrijskega proizvoda, po katerem bi mesto izstopalo, glavni simbol mesta pa so po njihovem manjše živilske trgovine (*dućani*): »Novi Pazar pomeni trgovsko mesto in ni nekega proizvoda, ki bi odražal njegovo identiteto. Med komunizmom so bila ustanovljena velika podjetja, kar pa ni bilo del naše tradicije. Novi Pazar je bil od nekdaj trgovsko mesto. Simbol mesta je majhna živilska trgovina, saj se je pri njej vse začelo in v njej si veliko ljudi služi kruh« (intervjuvanec 2).

Vprašani lokalno podjetništvo povezujejo predvsem s psihološkimi lastnostmi prebivalcev, pri čemer ga opisujejo kot močno uveljavljen način razmišljanja v lokalni skupnosti in ga ne povezujejo s kapitalizmom (kot nasprotje socializmu). Zdi se, da navedeno krepi njihovo samozavest: »Pravimo, da v tem pogledu Pazar ›pluje v lepih vodah‹. To pomeni, da ni krize, ki je ne bi mogli premagati« (intervjuvanec 10).

Omejene strukturne priložnosti v Novem Pazarju se pri intervjuvancih kažejo v močnem občutku, da mesto v primerjavi z drugimi podobno velikimi mesti v Srbiji gospodarsko nazaduje in da je zaradi novih državnih mej, ki so zmanjšale pomen cestnih povezav s Črno goro in Kosovom, ozemeljsko marginalizirano, kar se ne sklada z zgodovinsko identiteto Novega Pazarja kot trgovskega mesta: »Na splošno, če na primer pogledamo z vidika gospodarstva, smo v težkem položaju, v veliko težjem kot vsi drugi« (intervjuvanec 12), »Novi Pazar je središče srbske pokrajine Sandžak, ki je v primerjavi z drugimi pokrajinami ›črna luknja‹, kar je škoda« (intervjuvanec 4), »V primerjavi z drugimi podobno velikimi mesti ni preživelo niti eno podjetje v državni lasti, ki bi lahko ljudem še naprej zagotavljalo zaposlitev« (intervjuvanec 7), »Trgovsko mesto, ki ga v tej novi dobi blokirajo meje« (intervjuvanec 2).

Čeprav intervjuvanci ne kažejo apatije ali pomanjkanja zagnanosti, ki sta značilna za habitus perifernega mesta, omenjajo občutek gospodarskega nazadovanja in ozemeljske marginalizacije, kar pa je značilno za navedeni habitus. Tako se nekateri bojijo, da postaja Novi Pazar znan po slabo plačani delovni sili, sivi ekonomiji in nerazvitosti: »Novi Pazar je zelo reven ..., iz mestnega proračuna se črpa veliko denarja, zaradi česar potem ni mogoče narediti nekaterih drugih stvari. Vse, kar vidite, je siva ekonomija« (intervjuvanec 11).

Značilnosti habitusa perifernega mesta postanejo še opaznejše, ko intervjuvanci govorijo o tem, da zaradi centraliziranega modela upravljanja in zgoščenosti oblasti in pomembnih virov v prestolnici lokalni politiki in državni poslanci nimajo interesa, da bi podprli svoje mesto. Intervjuvanci v tem pogledu omenjajo pomanjkanje samoiniciativnosti in samozavesti med lokalnimi akterji, pomanjkanje zaupanja in zagnanosti med lokalnimi politiki in strokovnjaki, omejeno avtonomijo odločanja med strokovnjaki zaradi dajanja prednosti zvestobi izbrani politični stranki pred strokovnim znanjem, pomanjkanje participativnih praks pri lokalnem upravljanju ipd.: »Rasimova politična stranka [Rasim Ljajić je srbski politik, rojen v Novem Pazarju, op. a.], ima veliko vlogo, sam pa kaže le malo zanimanja ..., odselil se je in Pazar ga ne zanima več, zanima ga samo Beograd ...« (intervjuvanec 6), »Prednost ima pripadnost politični stranki, usposobljenost sploh ni pomembna« (intervjuvanec 1), »Tu ni sodelovanja med lokalno upravo in univerzo, ne sodelovanja med univerzo in lokalnim gospodarstvom, niti sodelovanja med lokalno upravo in nevladnim sektorjem« (intervjuvanec 8), »Krize nikoli ne povzroči pomanjkanje denarja, ampak pomanjkanje zaupanja ali, bolje rečeno, pomanjkanje zagnanosti« (intervjuvanec 4).

3.3 Reprezentacija mestne identitete na uradnem spletišču

To poglavje se osredotoča na vsebinsko analizo uradnega spletišča Novega Pazarja (Grad Novi Pazar, 2017) kot posebne oblike reprezentacije prostora, ki omogoča oblikovanje konkurenčne identitete mesta. Na splošno uradna spletišča namenjajo posebno pozornost kulturni in zgodovinski dediščini kot najpomembnejšemu vidiku identitete mesta (Morgan idr., 2004; Dragićević Šešić, 2009), pri čemer so spomeniki in arhitekturna dediščina med najbolj prepoznavnimi označevalci in simboli. Po Lynchu bi lahko Novi Pazar opisali kot predstavljivo mesto (ang. *imaginable city*), saj si ga zaradi številnih spomenikov in bogate arhitekturne dediščine, ki imajo velik zgodovinski in kulturni pomen, zlahka naslikamo pred očmi (Spasić in Backović, 2017). Avtorice so vizualno identiteto vključile v analizo kot posebno kategorijo, da bi ugotovile, ali so arhitekturna dediščina in spomeniki na spletišču prepoznani kot pomembni simboli mesta, in proučile raven ujemanja med vsebino spletišča in mnenji anketirancev. Poleg tega so analizirale obravnavo lokalne zgodovine, da bi ugotovile, kako so na spletišču predstavljene posamezne faze razvoja mesta. Predpostavile so, da če so predstavljene vse faze, to bolj prispeva k ohranjanju kolektivnega spomina in manj odraža habitus perifernega mesta, kot če so predstavljene samo nekatere in je socialistično obdobje izpuščeno.

Analiza spletišča mesta je pokazala, da potencial njegove kulturne in zgodovinske dediščine ni dovolj izkoriščen in da spletišče ne prikazuje močne vizualne identitete mesta. Trdnjava Bedem je prepoznana kot glavni simbol mesta, vendar na najpomembnejših podstraneh ni fotografij z njeno podobo. Verski objekti niso predstavljeni kot simboli mesta, čeprav na spletišču prevladujejo fotografije cerkva, samostanov in mošej, s čimer

je poudarjena predvsem večkulturna narava mesta. Omenjene fotografije niso na najpomembnejših podstraneh, poleg tega ni posebnih poglavij ali videov, ki bi bili posvečeni kulturni in zgodovinski dediščini mesta. Način reprezentacije ključnih označevalcev identitete in simbolov mesta na spletišču se ujema z mnenji intervjuvancev, ki med drugim izpostavljajo slabo promocijo znamenitosti in arhitekturne dediščine Novega Pazarja: »Naša turistična organizacija in mi kot mesto nimamo niti ene razglednice« (intervjuvanec 14).

Na spletišču je navedeno, da je bilo mesto v zgodovinskih virih prvič omenjeno leta 1461 kot *Yeni Bazar*, kar pomeni ›novi bazar‹, opis njegove zgodovine pa se konča konec 19. stoletja, ko naj bi, kot to navaja avtor spletišča, mesto izgubilo svojo nekdanjo politično in gospodarsko vlogo (Grad Novi Pazar, 2013). Navedeno kaže, da lokalna zgodovina ni predstavljena v celoti, hkrati pa potrjuje močno uveljavljenost identitete Novega Pazarja kot večkulturnega trgovskega mesta (Opština Novi Pazar, 2017). Na spletišču sploh ni omenjena zgodovina 20. stoletja ali socialistična preteklost mesta, so pa navedene številne značilnosti Novega Pazarja kot sodobnega mesta: univerzitetno mesto, mesto podjetnikov, mesto mladih, mesto priložnosti, mesto kavbojk in evropsko mesto (Gradska uprava Novi Pazar, 2016). Navedeno se ujema z izsledki analize spletišč drugih postsocialističnih mest, ki ne omenjajo socialistične preteklosti ali jo prikazujejo samo delno (Adler, 2005), pri promociji pa se predstavljajo kot sodobna kapitalistična evropska mesta. Zanemarjanje socialistične preteklosti kaže, da ima tudi Novi Pazar habitus perifernega mesta, ki je z vidika zunanjih identitetnih odnosov (tj. primerjave z drugimi evropskimi mesti) značilen za postsocialistična mesta.

Avtorice so na koncu proučile še komunikacijske značilnosti spletišča, da bi ugotovile, kako se lokalna uprava sporazumeva z notranjo in zunanjo javnostjo (prebivalci na eni strani ter turisti in morebitnimi vlagatelji na drugi) kot del participativnega pristopa k oblikovanju podobe mesta (Varbanova, 2007; Florek, 2011). V skladu z večkulturno podobo mesta je spletišče Novega Pazarja napisano v latinici in cirilici, vsebina pa ni v celoti prevedena v angleščino, kar pomeni, da vsebine zunanji javnosti niso zadostno na voljo niti ni z njimi stalno seznanjena. Interaktivnost je zagotovljena samo prek povezav do spletišč komunalnih služb, pri tem pa niso navedene povezave do družbenih omrežij, ki so danes najprimernejša interaktivna platforma za nagovarjanje javnosti. Navedeni izsledki kažejo, da interaktivni potencial, ki ga ima spletišče in omogoča bolj participativno oblikovanje konkurenčne mestne identitete, ostaja skoraj v celoti neizkoriščen.

4   Razprava

Prvi cilj analize je bil ugotoviti, kako anketiranci dojemajo označevalce identitete in simbole Novega Pazarja glede na njegove omejene strukturne priložnosti in hipotezo, da je identiteta mesta močnejša, če njegov habitus vzbuja enake ali podobne pozitivne pomene med prebivalci. Raziskava je pokazala, da je Novi Pazar mesto z močno identiteto. Izkazalo se je, da njegov habitus pri anketirancih v glavnem vzbuja pozitivne asociacije, pri čemer ni večjih razlik med družbenimi skupinami (tj. med ljudmi različne starosti, izobrazbe ali narodnosti). Najpogosteje omenjeni mestni simboli se nanašajo na kulturno dediščino, zlasti spomenike in arhitekturno dediščino, povezane z večetnično in večversko zgodovino mesta. Med lastnostmi prebivalcev pri odgovorih anketirancev izstopajo trgovska (podjetniška) miselnost in posledična gostoljubnost ter strpnost med etničnimi skupinami in kulturami. Opisana pozitivna samopodoba se ne ujema z mnenjem anketirancev, da imajo drugi prebivalci Srbije negativno predstavo o Novem Pazarju. Navedeno kaže, da na mnenje anketirancev glede zunanje identitete mesta (na podlagi primerjave z drugimi srbskimi mesti) vpliva habitus perifernega mesta, kar je opazno zlasti pri odgovorih, ki se nanašajo na ključne ovire za oblikovanje konkurenčne identitete Novega Pazarja.

Drugi cilj analize je bil ugotoviti, ali habitus socialističnega industrijskega mesta (ki pooseblja polpreteklo zgodovino mesta) in habitus perifernega mesta (ki lahko ovira sposobnost delovanja lokalnih akterjev) ovirata oblikovanje konkurenčne identitete Novega Pazarja. Opisano se je izkazalo za precej zapleteno raziskovalno vprašanje, saj anketiranci kot ključen označevalec mestne identitete in razvojni potencial močno poudarjajo lokalno podjetništvo, ki pa se ne ujema s pomanjkanjem zagnanosti in empatijo prebivalcev, ki sta značilna za habitus perifernega mesta. Poleg tega je zaradi močno uveljavljenega habitusa trgovskega mesta, ki temelji na lokalnem podjetništvu, kriza identitete Novega Pazarja v postsocialističnem obdobju veliko manjša, kot bi lahko bila zaradi vpliva habitusa industrijskega socialističnega mesta. Anketiranci trdijo celo, da Novi Pazar sploh nikoli ni imel identitete industrijskega mesta, niti med socializmom. Po drugi strani opozarjajo na majhno avtonomijo lokalnih akterjev, značilno za habitus perifernega mesta, ta je posledica modela upravljanja, ki ga v postsocialističnem obdobju obvladujejo politične stranke in centralizirana državna oblast. Zaradi tega je lokalno podjetništvo v glavnem potisnjeno na rob, v sivo ekonomijo, kar po mnenju anketirancev slabša ugled mesta ter prispeva k nerazvitosti in perifernosti mesta in njegovi ozemeljski marginalizaciji po vzpostavitvi novih državnih mej po razpadu Jugoslavije. Intervjuvanci dojemajo Novi Pazar predvsem kot trgovsko mesto in pričakujejo, da se bo z vstopom Srbije v Evropsko

unijo znebilo svojega perifernega položaja: »Z odprtjem mej bo Novi Pazar postal trgovsko središče sodobne srbske regije in Evropske unije« (intervjuvanec 4). Kljub vsemu se zdi, da anketiranci podcenjujejo morebitne negativne vplive habitusa perifernega mesta ob vključitvi v Evropsko unijo, razvidne iz izkušenj drugih postsocialističnih mest.

Tretji cilj analize je bil proučiti, ali se simboli identitete Novega Pazarja, predstavljeni na uradnem spletišču mesta, ujemajo s tistimi, ki so bili omenjeni v anketi in intervjujih. Avtorice so predpostavile, da je tovrstno ujemanje temeljni pogoj, da se doseže potrebna pristnost pri oblikovanju mestne identitete. Čeprav rezultati raziskave potrjujejo ujemanje med vsebino spletišča ter mnenji anketirancev in intervjuvancev, je potencial spletišča, da s komunikacijo med ustvarjalci in javnostjo omogoči bolj participativno oblikovanje mestne identitete, skoraj popolnoma neizkoriščen. Poleg tega večstoletna zgodovina Novega Pazarja ni predstavljena v celoti, kar je posledica habitusa perifernih postsocialističnih mest v zunanjih (mednarodnih) identitetnih odnosih. Dejstvo, da je bližnja preteklost mesta na spletišču zanemarjena, se ujema z nesprejemanjem socialistične preteklosti pri drugih postsocialističnih mestih, čeprav anketiranci nimajo negativnih asociacij na socialistično preteklost, kar je morda posledica bolj liberalne narave socializma v Jugoslaviji (Lazić, 2011). V nasprotju s srednjeevropskimi postsocialističnimi mesti, ki poudarjajo svojo gospodarsko moč in podjetništvo iz časa tik pred socializmom, iz analize spletišča in intervjujev s strokovnjaki ni razvidno, da bi se pri promociji mesta izpostavljalo predsocialistično obdobje poznega 19. ali zgodnjega 20. stoletja. Navedeno je lahko povezano tudi z dejstvom, da intervjuvanci lokalno podjetništvo dojemajo predvsem kot miselnost, ki je močno uveljavljena v dolgi tradiciji Novega Pazarja kot trgovskega mesta in nima povezave s kapitalizmom. Možno je tudi, da so se ustvarjalci spletišča želeli izogniti notranjim ali zunanjim nesoglasjem pri interpretaciji bližnje preteklosti in tako olajšati vnovično opredelitev mestne identitete v postsocialistični Srbiji, obremenjeni z medetničnimi trenji.

5 Sklep

Avtorice so z raziskavo dobile vpogled v to, ali ima srednje veliko mesto, ki se spopada z razvojnimi težavami, dovolj trdne temelje za oblikovanje konkurenčne identitete. V primeru Novega Pazarja ujemajoči se odgovori anketirancev glede ključnih označevalcev mestne identitete in njihovo navdušenje nad lokalnim podjetništvom kažejo, da ima mesto velik potencial za oblikovanje konkurenčne identitete. Hkrati občutki gospodarske, politične in ozemeljske marginalizacije, ki so jih izrazili anketiranci, opozarjajo na ovire, ki izhajajo iz habitusa perifernega mesta. Z vidika neoendogene mestne politike, katere cilj

je oblikovati identiteto mesta kot razvojni vir in ki predpostavlja, da se največji razvoj doseže z medsebojnim dopolnjevanjem endogenih in eksogenih razvojnih dejavnikov (Vanclay, 2011), je treba razmisliti o tem, za katere programe v mestu bi bilo treba zagotoviti zunanja (državna ali mednarodna) razvojna sredstva. Programi bi morali omogočati medsebojno dopolnjevanje endogenih in eksogenih razvojnih dejavnikov ter krepiti predvsem lokalno podjetništvo, ki se trenutno spopada s precejšnjimi strukturnimi omejitvami. To bi omogočilo ustrezno delovanje lokalnih akterjev, ki je potrebno za to, da se izkoristijo lokalni potenciali za (ponovno) oblikovanje strukturnih priložnosti in konkurenčne identitete Novega Pazarja.

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Primerjava mnenj prebivalcev treh tipov stanovanjskih območij v Kijevu glede kakovosti življenja

Urbanistične raziskave, opravljene na globalnem severu, kažejo, da je z vidika organizacije časa in prostora, vrednot in družbenih stikov tradicionalni polodprti stavbni blok nizke zazidave z mešanimi funkcijami najprivlačnejši morfološki tip stanovanjske gradnje v mestih. Avtorji v članku proučujejo, ali osnovne urbanistične hipoteze glede udobnosti bivanja na stanovanjskih območjih različnih morfoloških tipov veljajo tudi za ukrajinsko prestolnico. Primerjajo kakovost življenja ter analizirajo razlike v vedenjskih vzorcih in zaznavah prostora prebivalcev različnih tipov stanovanjskih območij, da bi opredelili glavne značilnosti najudobnejše oblike stanovanjske soseske. Na podlagi ankete in strokovnih ocen proučujejo zgodovino, delovna mesta, družbene, izobraževalne in kulturne storitve, okoljske kazalnike, stopnjo varnosti in sodelovanje javnosti v treh stanovanjskih soseskah v mestu: v

Žuljanyju, Podilu in Rusanivki. Žuljany je naselje prostostoječih enostanovanjskih hiš, Podil je soseska s polodprtimi stavbnimi bloki nizke zazidave, Rusanivka pa je primer sovjetske modernistične visoke blokovske zazidave. Izsledki raziskave kažejo, da je na podlagi objektivnih kazalnikov in mnenj prebivalcev Rusanivka najudobnejše stanovanjsko območje v mestu, kar se ne ujema s splošno sprejetimi teorijami o najbolj zglednih in najprivlačnejših morfoloških tipih mestne stanovanjske gradnje. Privlačnost omenjene soseske je posledica njenih načrtovalskih in gradbenih značilnosti, zlasti osredotočenosti na človeka ter dobro premišljenega in celostnega načrtovalskega pristopa.

Ključne besede: urbana morfologija, stanovanjske soseske, kakovost življenja, zaznave, Kijev

1   Uvod

Eden glavnih ciljev proučevanja kakovosti življenja na različnih mestnih območjih je ugotoviti, kaj bi bilo treba spremeniti, da bi se izboljšale bivalne razmere prebivalcev. Izboljšave se lahko dosežejo z ustreznim upravljanjem, načrtovanjem in oblikovanjem mest. Katera oblika stanovanjske gradnje je najboljša za prebivalce, je logično vprašanje, ki se zastavlja pri upravljavskih odločitvah postsocialističnih mest, v katerih so bila urbana območja oblikovana v obdobju socialističnega režima, zdaj pa se preoblikujejo in se prilagajajo novim razmeram, na katere vplivajo politični, gospodarski in kulturni prehod v kapitalistično družbo (Sýkora, 2009). Vprašanje je še zlasti pomembno za Kijev, kjer se soseske s tradicionalnimi stavbnimi bloki, prostostoječimi enostanovanjskimi hišami ali modernističnimi sovjetskimi bloki zdaj aktivno in kaotično združujejo s strnjenimi stanovanjskimi kompleksi, značilnimi za neoliberalno postsovjetsko obdobje (Dronova in Brunn, 2018). Da bi lahko odgovorili na to vprašanje, je treba opredeliti ključne značilnosti različnih oblik mestnih stanovanjskih sosesk, ki se nanašajo na kakovost življenja njihovih prebivalcev. Poleg tega je treba ugotoviti, kako zadovoljni so stanovalci s svojimi bivalnimi razmerami, kaj jih skrbi in kako bivalno okolje vpliva na njihovo vedenje, prostorske zaznave in aktivnosti v skupnosti. Navedena problematika je zelo aktualna z vidika obnove ukrajinskih mest, uničenih v ruskem napadu leta 2022. Povojna obnova mora namreč temeljiti na poglobljenih predhodnih znanstvenih raziskavah.

Številne raziskave s področja urbane morfologije proučujejo mesta kot človekove življenjske prostore, s poudarkom na mestnih oblikah (Moudon, 1997, Gauthier in Gilliland, 2006, Standard, 2019). Kot navaja Lynch (1984), ki velja za pionirja na področju proučevanja človekovih življenjskih prostorov, je mestna oblika zapleten in skrivnosten sistem človeških vrednot, kar razkriva pomembnost kognitivnega pristopa in tega, kako človek zaznava podobo mestnega okolja (Jang in Kim, 2019). Pomembne in zanimive so torej medsebojne povezave med procesi: med tem, kako ljudje oblikujejo prostor, in tem, kako mestne oblike vplivajo na življenje ljudi. V preteklih urbanističnih raziskavah so bile proučene najbolj optimalne oblike stanovanjske gradnje, ki omogočajo udobno bivanje. Z vidika organizacije prostora in časa, vrednot in družbenih stikov je najprivlačnejši morfološki tip stanovanjske gradnje tradicionalni polodprti stavbni blok nizke gradnje z mešanimi funkcijami, aktivnimi fasadami na ulični strani, visoko stopnjo varnosti, osnovnimi storitvami, družbeno javno infrastrukturo, uličnimi trgovinami in živahnim nočnim življenjem (Alexander, 1977; Gehl, 2013; Rapoport, 2016; Talen, 2019). Zaradi pomanjkanja funkcij in družabnih aktivnosti soseske z zasebnimi prostostoječimi hišami ne veljajo za dovolj udobne, enako velja za sovjetske modernistične blokovske soseske, zlasti zaradi
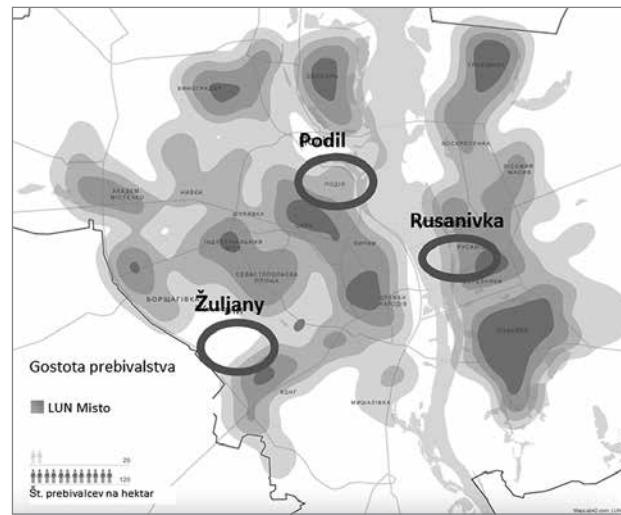
Slika 1: Karta gostote prebivalstva v Kijevu z označenimi lokacijami treh proučevanih območij (ilustracija: povzeto po LUN misto, 2019)

raztresenosti prostorov in izoliranosti zgornjih nadstropij od vsakršne oblike družabnega življenja.

Avtorji v raziskavi, ki se osredotoča na Kijev, proučujejo, ali navedene osnovne urbanistične hipoteze glede udobnosti bivanja na stanovanjskih območjih različnih morfoloških tipov veljajo tudi za postsocialistično mesto. Poleg tega analizirajo mnenja, miselne predstave in preference Kijevčanov glede nekaterih tipov stanovanjskih območij, ki so se razvili kot posledica zgodovinskih, družbenogospodarskih in političnih razmer (Conzen, 1960). Za raziskavo so avtorji izbrali tri območja v okviru upravnih mej ukrajinske prestolnice (slika 1), ki ponazarjajo različne morfološke tipe stanovanjske gradnje: Žuljany (naselje prostostoječih enostanovanjskih hiš), Podil (soseska polodprtih stavbnih blokov nizke zazidave) in Rusanivko (sovjetsko modernistično blokovsko sosesko). Na vsakem območju so na podlagi spletne ankete in poglobljenih intervjujev proučili mnenja stanovalcev o bivalnih razmerah, njihovi vključenosti v življenje skupnosti, stikih z okoliškimi prostori in stopnji varnosti.

Glavni cilji raziskave so: a) primerjava kakovosti življenja prebivalcev treh proučevanih sosesk, b) analiza razlik v vedenjskih vzorcih in spoznavnih zemljevidih stanovalcev sosesk različnih morfoloških tipov in c) opredelitev značilnosti najudobnejšega morfološkega tipa stanovanjske soseske v ukrajinski prestolnici. Avtorji ob upoštevanju zgodovinskih okoliščin oblikovanja sosesk primerjajo kakovost življenja stanovalcev teh sosesk z vidika bivalnega udobja, raznolikosti in funkcionalnosti. Analizirajo zlasti razpoložljivost delovnih mest, družbene infrastrukture ter izobraževalnih in kulturnih ustanov, onesnaženost zraka, raven hrupa, razpoložljivost zelenih površin in drugih odprtih javnih prostorov ter stopnji varnosti in aktivnosti v skupnosti.

2 Teoretično ozadje

Pri proučevanju oblik mestnega okolja je priporočljivo uporabljati homogene tipološke enote. Avtorji v članku uporabljajo pojem urbane morfologije, ki se nanaša na kompleksen niz značilnosti fizičnih objektov in mestnega prostora (Sarjala idr., 2016). Povezan je z zgodovinskimi in kulturnimi okoliščinami gradnje nepremičnin in načrtovanja gradnje ter s funkcionalnim namenom objektov in njihovo raznolikostjo. Na splošno se urbana morfologija nanaša na fizično obliko naselij ali, natančneje, povezana je z oblikovanjem prvin mestnega tkiva in razmerji med njimi, ki razkrivajo njihovo sestavo in konfiguracijo skozi čas (Chiaradia, 2019). Mestna oblika pa se nanaša na glavne fizične prvine, ki oblikujejo mesto, med katerimi so najpomembnejši ulice, trgi (javni prostori), kareji, parcele in stavbe (Oliveira, 2016). Urbani morfološki tipi so posplošeni modeli, ki določajo družbeno-prostorske komplekse (Krasheninnikov, 2019). Povezani so z družbenimi, gospodarskimi ali političnimi procesi v mestu in se pogosto uporabljajo pri urbanističnem oblikovanju, saj tvorijo povezavo med abstraktnimi zamislimi in resničnimi oblikami (Moudon, 1994). Nekatere značilnosti človeškega vedenja so odvisne od prostora, po drugi strani pa ponavljajoči se vedenjski vzorci spreminjajo prostor, kar kaže na to, da različne notranje spremenljivke vplivajo na oblikovanje različnih morfoloških tipov mestnega okolja. Pomembno je, da se te prostorske spremenljivke upoštevajo tudi pri proučevanju vedenja prebivalcev in tega, kako prebivalci zaznavajo okolje, v katerem živijo.

V šestdesetih letih 20. stoletja je bil Lynch (1960) med prvimi raziskovalci, ki so začeli proučevati zaznave in miselne predstave, ki jih imajo prebivalci o mestu. Menil je, da tehnokratski modernistični pristop k razvoju mest ne upošteva prostorsko-časovne kompleksnosti in dinamike mestnih organizmov ter povzroča razčlovečenje mesta. Mnenje, da modernistično funkcionalno načrtovanje ustvarja nečloveška in neposeljena območja, je imelo že v šestdesetih letih prejšnjega stoletja močno podporo v znanstvenih in upravnih krogih globalnega severa (Jacobs, 1961; Fyfe, 1996). V sedemdesetih letih 20. stoletja so sovjetski arhitekti in načrtovalci mest ter pozneje urbanisti začeli zagovarjati tudi ideje antifunkcionalizma. Kot navaja Glazychev (2008), so se sanje modernistov dvajsetega stoletja uresničile v Sovjetski zvezi, kar je hkrati prineslo več težav kot uspešnih rešitev. Mesto stolpnic, kot ga je predlagal Le Corbusier in v katerem so stolpnice naključno umeščene v zeleni prostor, je uničilo tradicionalni sistem dvorišč in sosesk ter ustvarilo prazen enovit prostor (Jacobs, 2006).

V razpravo so se vključili tudi drugi avtorji. Gutnov (1984) je na primer poudaril, da so imele ideje socializma skupaj z načeli ortodoksnega funkcionalizma v nekem obdobju pozitivno

vlogo pri reševanju družbenih problemov po drugi svetovni vojni. Po drugi strani je svobodno načrtovanje prispevalo k slabši kakovosti bivalnega okolja, pri čemer velika brezoblična notranja območja sosesk pripadajo vsem stavbam, hkrati pa zaradi tega ostajajo infrastrukturno neurejena. Na dvorišče lahko zdaj vstopajo prišleki in vozila. Alexander (1977) je veliko pozornosti namenil razumevanju udobnih morfoloških tipov mestne gradnje, ki združujejo razne funkcije, in posameznikovemu zaznavanju prostora. Ob upoštevanju optimalne višine stavb je opazil, da je modernistična vrstna zazidava neudobna, saj stavbe ustvarjajo senco na ulici in dajejo občutek monotonega prostora. Menil je, da je najbolje razporediti hiše v skupine z različnimi gabariti in arhitekturnimi rešitvami. Gehl (2013) je to še nadgradil in se ni opiral samo na družbene vidike posameznih morfoloških tipov sosesk, ampak se je poglobil tudi v biološke mehanizme človekovega pogleda na svet. Poudaril je, da bi morali pri načrtovanju za prihodnost pozornost od stavbe preusmeriti k človekovemu življenju. Pri oblikovanju udobnega mestnega okolja se je treba najprej osredotočiti na človekovo življenje, nato na prostor in šele na koncu na stavbo. Zagovorniki novega urbanizma (npr. Garde, 2020) že dolgo podpirajo odmik od funkcionalnega coniranja, ki prekinja povezavo med mestnim prostorom in prebivalci ter povzroča nenačrtno širjenje mestnega prostora.

Na globalnem severu so bili pobudniki modernističnih načel v urbanizmu arhitekti, v Sovjetski zvezi pa je bil razlog za njihovo množično uvedbo izrazito političen (Dronova in Maruniak, 2019). Sovjetsko obdobje je delno zaznamovalo vsa ukrajinska mesta. Ustvarilo je novo kulturno plast in posebno arhitekturno podobo, ta je bila posledica množične visoke gradnje, ki je pustila globoko sled v zavesti mestnih prebivalcev. V nasprotju z Zahodno Evropo, kjer so bila modernistična naselja, ki so jim vlade nasprotovale, v zatonu (Le Normand 2014), so bile množično zgrajene blokovske soseske v Ukrajini integrirane v mestno strukturo in glede na to, da so stanovanja v Ukrajini na splošno zelo slabe kakovosti, te soseske še vedno veljajo za zadovoljive kraje za bivanje. Čeprav se njihovi stanovalci zaradi raznih gospodarskih, družbenih in drugih dejavnikov pogosto čutijo odtujene od preostalega mestnega prostora, se ne preselijo drugam (Mysak, 2014).

V okviru sovjetskega urbanističnega načrtovanja so bile soseske obravnavane kot prvine materialnega prostora človekovih vsakdanjih aktivnosti, ne kot večfunkcionalni prostori. Po razpadu socialističnega bloka so se morala mesta spopasti z novimi izzivi: morala so razmisliti o preteklih načrtovalskih rešitvah in poiskati nove. Današnja postsocialistična mesta se v omrežju evropskih mest dojemajo kot ločena prvina. Neoliberalizem velja za prevladujočo ideologijo v državah nekdanjega socialističnega bloka (Stenning idr., 2010). Golubchikov idr. (2014) razvoj postsocialističnih mest obravnavajo z vidika hibridnih

prostorov, ki nastajajo kot skupna posledica neoliberalizma in socialistične preteklosti. Socialistična dediščina je bila odtujena od svoje zgodovine in spremenjena v infrastrukturo neoliberalizacije. Na podlagi morfologije, rabe prostora in družbene segregacije lahko v teh mestih na eni strani najdemo značilna kapitalistična območja, na drugi strani pa območja, ki so zamrznjene podobe socializma (Sýkora in Bouzarovski, 2012).

Raziskave kakovosti življenja v postsocialističnih mestih kot kompleksnega teoretičnega pojma kažejo povezave med številnimi področji javnega načrtovanja, zasebnega življenja in človekovega zaznavanja (Massam, 2002). Številne novejše raziskave kažejo, da je izboljšanje kakovosti življenja ljudi ključno, in opisujejo s tem povezane rešitve na področju urbanističnega načrtovanja (Murgaš in Klobučník, 2016; Faka, 2020, Merschdorf idr., 2020). Raziskovalci kakovost življenja povezujejo z življenjskim zadovoljstvom, ki se pogosto razume in upošteva v kontekstu kakovosti kraja (Dehimi, 2021). Raziskave kakovosti življenja vključujejo številne razsežnosti, med njimi gospodarske, družbene, kulturne in okoljske dejavnike ter demografijo, vpetost, varnost, angažiranost lokalnih prebivalcev in človekovo zaznavanje grajenega okolja. Raziskava, predstavljena v tem članku, se osredotoča tako na objektivno resničnost kot na subjektivne zaznave (Marans, 2001).

Pri proučevanju kakovosti življenja v ukrajinskih naseljih Gukalova (2013) ugotavlja, da se kljub čedalje bolj pozitivnim vrednostim nekaterih kazalnikov kakovost življenja še vedno reproducira na podlagi ekstenzivnega modela razvoja družbe, kar prinaša izzive v zvezi z zagotavljanjem kakovosti bivanja. Posebnosti postsocialistične preobrazbe ukrajinskih mest razkrivajo prejšnje raziskave (Melnychuk in Gnatiuk, 2019; Mezentsev idr., 2019; Dronova idr., 2021; Hudzeliak, 2021), v katerih so raziskovalci proučevali, kako morfološki tipi sosesk prispevajo k oblikovanju skupnosti in kako jih zaznavajo prebivalci teh sosesk. V raziskavi, predstavljeni v tem članku, avtorji analizirajo značilnosti morfoloških tipov stanovanjskih sosesk v Kijevu.

3   Podatki in metode

Raziskava se osredotoča na zaznavanje prostora, ki obsega prostorske in družbene prvine ter odnose med njimi. Prostorski vidik raziskave vključuje opredelitev zgodovinskih razmer, povezanih z oblikovanjem ozemelj, sodobnih mej in morfoloških tipov, ter analizo bivalnega udobja, ki temelji na kvantitativnih in kvalitativnih parametrih. Družbeni vidik raziskave se nanaša na analizo parametrov, kot so družbeno-psihološka identifikacija posameznikov v razmerju do prostora, občutek pripadnosti območju in odgovornosti zanj, raven psihološke in čustvene povezave s prostorom in dojemanje samega sebe

kot del skupnosti. V tem okviru so proučene tudi naslednje vrste družbenih interakcij: dobri sosedski odnosi, organizirani medsebojni odnosi in aktivnosti v skupnosti v okviru javnih projektov (Paniotto in Kharchenko, 2017).

Prostorske in zgodovinske značilnosti, ki jih avtorji proučujejo, se nanašajo na naslednje morfološke tipe stanovanjskih območij, opredeljene v uradnih ukrajinskih načrtovalskih dokumentih (Derzhavni budivelni normy, 2019):

- na območje samostoječih enostanovanjskih hiš (Žuljany): prvina mestnega razvoja, za katero so značilne samostojne hiše ali skupine stavb s pripadajočimi zemljišči;
- na soseko polzaprtih stavbnih blokov nizke zazidave (Podil): glavna tradicionalna prvina mestnega prostora v obliki zaprtih ali polzaprtih stavbnih blokov (z dvo- ali trinadstropnimi stavbami) ob avtocesti (površine 20–50 ha);
- na soseko s sovjetsko visoko blokovsko zazidavo (Rusanivka): območje stanovanjskih blokov s pripadajočimi zemljišči velikosti 80–400 ha, ki jih ločujejo glavne ulice in prometnice v mestu. Ta tip soseske je plod sovjetskega urbanističnega načrtovanja. Kot ločena podtipa se pojavljata tudi soseski s srednje visokimi bloki (z do petimi nadstropji) in visokimi bloki (z več kot petimi nadstropji).

Raziskava je bila izvedena v dveh fazah. V prvi fazi so avtorji zbrali in analizirali prosto dostopne podatke državnega statističnega urada, javnih organizacij, znanstvenih ustanov in podjetij. Metodologija je temeljila na uporabi kriterijev, s katerimi so avtorji proučevali kvalitativne in kvantitativne značilnosti posamezne soseske. Pri tem so ocenjevali naslednje kazalnike, povezane s kakovostjo življenja: ekološke kazalnike (kakovost zraka, obremenitev s hrupom in prisotnost okolju škodljive industrije), gospodarske kazalnike (razpoložljivost delovnih mest, večfunkcionalna ali monofunkcionalna raba prostora) in družbene kazalnike (razpoložljivost trgov in parkov, izobraževalnih in zdravstvenih ustanov, trgovin in restavracij). Podatki, ki se nanašajo na naštete kazalnike, zgodovinske okoliščine in gostoto prebivalstva, so bili pridobljeni iz zgoraj omenjenih prosto dostopnih virov. Družbene stike ter stopnjo javne participacije in vpetosti prebivalcev so avtorji analizirali na podlagi občinskih projektov, odobrenih v okviru državnega proračuna. Kakovost življenja v soseskah so torej primerjali na podlagi izbranih kriterijev (slika 2), ki so jih uporabili za izračun skupne ocene. Kakovost *življenja za* vsak tip soseske so ocenili na podlagi tristopenjske lestvice (0 pomeni najnižjo kakovost, 3 pa najvišjo kakovost).

Poleg kakovosti življenja so avtorji proučili tudi vedenjske vzorce prebivalcev in to, kako zaznavajo svojo sosesko. V drugi fazi so tako opravili terenske sociološke raziskave prostorskega zaznavanja (slika 2). Najprej so med februarjem in marcem 2021 opravili pet poglobljenih intervjujev, na podlagi

Slika 2: Uporabljena raziskovalna metodologija (ilustracija: avtorji)

katerih so oblikovali vprašalnik za večji vzorec anketirancev. Z intervjuji so lahko primerjali vedenjske vzorce in razmišljanje posameznikov v proučevanih treh morfoloških tipih sosesk. Intervjuvanci so bili mladi podnajemniki, stari med 25 in 30 let: ženska iz Žuljanja, moški in ženska iz Rusanivke ter moški in ženska iz Podila. Poleg poglobljenih intervjujev so avtorji opravili še anketo na večjem vzorcu prebivalcev omenjenih treh sosesk. Spletno anketo s 23 vprašanji so aprila 2021 objavili na Facebookovem profilu posamezne soseske. Cilj je bil pridobiti čim več podatkov o osnovnih kazalnikih zaznavanja prostora. Vprašanja so bila razdeljena v naslednje tematske sklope: dostopnost storitev in objektov, prometna dostopnost, stopnja razvitosti javne infrastrukture, stopnja in kakovost komunalne opremljenosti, obremenitev s hrupom, kakovost zraka, kraji, ki so prebivalcem všeč in na katerih se počutijo varne (na podlagi kognitivnih zemljevidov), vpetost prebivalcev v življenje skupnosti, njihovi stiki s prostorom in njihove splošne zaznave prostora v soseski.

Poglobljeni intervjuji, anketa, strokovna ocena prosto dostopnih analitičnih, statističnih, projektnih in znanstvenih podatkov na podlagi izbranih kriterijev ter končna obdelava vseh pridobljenih podatkov na podlagi socioloških in geografskih metod (analize, sinteze, posplošitve, sistematizacije in kartiranja) so na kratko predstavljeni na sliki 2.

4   Rezultati

4.1   Proučevane soseske v zgodovini Kijeva

Izbrana stanovanjska območja so nastala v različnih zgodovinskih obdobjih in družbenogospodarskih razmerah, ki so močno vplivali na vrsto gradnje, obliko bivalnega prostora in to, kako prebivalci zaznavajo ta prostor (sliki 3 in 4). Pred priključitvijo Kijevu je bil Žuljany vas, kar pojasnjuje, zakaj je sredi mesta tako veliko stanovanjsko območje zasebnih prostostoječih hiš. Za Žuljany so značilni nizke hiše ter to, da ni značilnih mestnih prvin in praks. Tamkajšnja krajina ima izrazito kmečke prvine: prevladujejo kmetije, sosedje se med seboj poznajo, območje pa je nekoliko oddaljeno od družbene infrastrukture in trgovin (slika 3a).

Stavbe v polzaprtih stavbnih blokih v soseski Podil so bile zgrajene v pomembnem zgodovinskem obdobju, današnjo podobo pa so dobile na koncu 20. in na začetku 21. stoletja. V Podilu prevladujejo večstanovanjske stavbe, katerih glavna značilnost je aktivna ulična fasada s trgovinami, bankami, brivnicami, kavarnami in drugimi poslovnimi enotami v pritličju. Aktivne ulične fasade so imele storitveno funkcijo, kar še naprej ostaja značilno za Podil. Danes se samo pol nadstropij v stavbah upo-

Slika 3: Proučevana stanovanjska območja: a) Žuljany (vir: Dom.ria), b) Podil (vir: Kyiv heritage guide) in c) Rusanivka (vir: Informator.press)

a) Žuljany

b) Podil

Stanovanjske stavbe
Proučevano območje
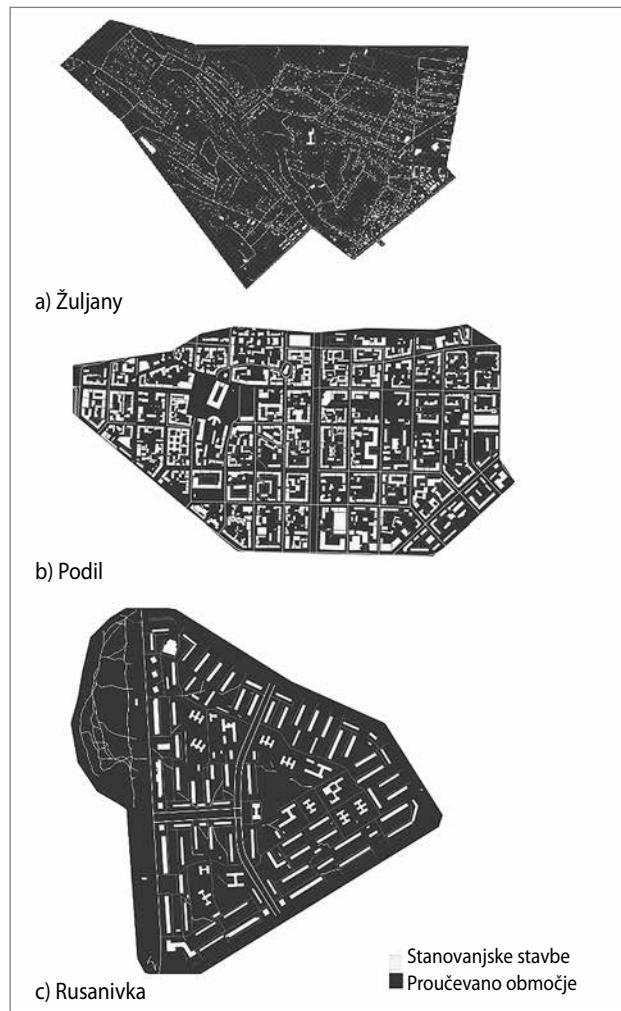
c) Rusanivka

Slika 4: Prostorska zgradba proučevanih stanovanjskih območij (ilustracija: avtorji)

rablja za stanovanja. Pritličje običajno zasedajo trgovine, veliko je tudi pisarn in kulturnih prostorov (slika 3b).

Rusanivka je bila med prvimi prostorskimi eksperimenti sovjetskih arhitektov v 20. stoletju. Stavbe v soseski so mešanega tipa in imajo posebno zgradbo: vzdolž promenade ob Rusanivskem kanalu stojijo devetnadstropni bloki, med katerimi kot prostorske dominante izstopajo posamični šestnajstnadstropni bloki (slika 3c). Pomembna prvina soseske je bilo zelo aktivno pritličje stavb s trgovinami, frizerskimi saloni in veleblagovnicami. Skupaj s stavbami je bila zgrajena tudi vsa potrebna družbena javna infrastruktura (npr. vrtci, šole, trgovine, kulturne ustanove in kinodvorane).

Žuljany in Rusanivka imata precejšen delež zelenih površin, hkrati pa sta slabo vključena v mestno krajino. Vzroki za to so različni. Žuljany je odmaknjeno mestno območje in je bilo dokaj pozno priključeno Kijevu. Njegova prostorska ureditev preprečuje tesnejše vezi s sosednjimi območji, zato funkcionalno ni povezano z okolico. Rusanivka je skoraj v mestnem

središču, hkrati je v zgradbi mesta popolnoma ločeno območje. Razloga za to sta dva. Prvič, soseska leži na otoku, obdanem s kanali reke Dneper, ki delujejo kot nekakšna meja, ki sosesko ločuje od sosednjih območij. Ozke prometne povezave z otokom pa preprečujejo širjenje urbanih procesov iz preostalega mesta na otok. Drugič, Rusanivka je bila načrtovana in oblikovana kot mesto v mestu, z vsemi funkcijami, ki zagotavljajo udobno mestno življenje. V kijevsko mestno krajino je tako popolnoma vključen samo Podil, ki leži v središču mesta. Je dobro prometno dostopen, ima nekaj zelenih površin, hkrati pa v njem ni vrzeli v prostoru niti v družbeni interakciji. V soseski aktivno potekajo vsi mestni procesi, ki se aktivno širijo na sosednja območja.

Pomemben parameter v prostorski zgradbi in zgodovinskem ozadju vseh treh obravnavanih območij, ki vpliva na njihove družbene procese, je gostota prebivalstva (slika 1). Avtorji so zato izračunali gostoto prebivalstva v vsaki soseski. Najnižjo gostoto ima Žuljany, kjer živi 15 ljudi na hektar (skupno število prebivalcev je približno 6.400). Nizka gostota je posledica razpršenosti prebivalcev po precej velikem območju ter vpliva na (ne)dostopnost družbenih funkcij in prometno povezanost. V Podilu živi 135 ljudi na hektar (skupno število prebivalcev je približno 23.000), povprečno število dejanskih uporabnikov prostora pa je 3,5- do 4-krat večje, saj Podil dnevno obišče veliko ljudi, od katerih jih večina ne živi v soseski. Navedeno vpliva na veliko stvari, tudi na samozavest prebivalcev, ki soseske ne morejo šteti popolnoma za svojo. Največjo gostoto prebivalcev ima Rusanivka, kjer živi približno 150 ljudi na hektar. Treba je omeniti, da v nasprotju s Podilom ni privlačna za turiste, zato se število uporabnikov prostora v soseski približno ujema s številom stalnih prebivalcev. Je pa rusanivska obrežna promenada privlačen kraj za Kijevčane, kar pomeni, da se število njenih obiskovalcev ali uporabnikov čez leto spreminja.

4.2 Rezultati strokovne ocene

Pri oceni okoljskih kazalnikov, kot so kakovost zraka, obremenitev s hrupom in prisotnost okolju škodljive industrije, so bile najboljše vrednosti izmerjene za Rusanivko, ki zaradi svoje posebne stanovanjske gradnje, družbenih funkcij in ugodne prostorske ureditve velja za eno izmed najčistejših območij Kijeva. Poleg tega v njej ni podjetij, katerih dejavnost bi škodljivo vplivala na okolje (preglednica 1).

Pri ocenjevanju gospodarskih kazalnikov, zlasti večfunkcionalne rabe prostora in razpoložljivosti delovnih mest, so avtorji opazili dve skrajnosti: izrazito večfunkcionalno rabo prostora v Podilu in izključno stanovanjsko funkcijo prostora v Žuljanyju. V Rusanivki skoraj ni pisarniških prostorov, trgovin ali proizvodnih obratov. Soseska zagotavlja udobno bivanje ter prilož-

Preglednica 1: Ocena kazalnikov kakovosti življenja v proučevanih soseskah

Kazalniki	Žuljany	Podil	Rusanivka
Ekološki			
Kakovost zraka	2	1	2
Obremenitev s hrupom	1	0	3
Okolju škodljiva industrija	3	2	3
Gospodarski			
Večfunkcionalna raba prostora	0	3	2
Razpoložljivost delovnih mest	0	3	1
Družbeni			
Razpoložljivost trgov in parkov	1	2	3
Razpoložljivost izobraževalnih ustanov	1	2	3
Razpoložljivost zdravstvenih ustanov	0	2	2
Razpoložljivost trgovin in supermarketov	2	3	2
Razpoložljivost restavracij	1	3	3
Stopnja varnosti	3	2	3
Skupna ocena	14	23	27

nosti za rekreacijo in vso potrebno družbeno infrastrukturo, večina prebivalcev pa se na delo vozi v druge predele Kijeva.

Ocena družbenih kazalnikov je pokazala jasne razlike med soseskami (preglednica 1). Družbena infrastruktura je najbolje razvita v Rusanivki, kar je posledica zgodovinskih okoliščin njenega nastanka: zasnovana je bila popolnoma na novo v okviru planskega socialističnega upravljanja, katerega glavni cilj je bil zadovoljiti družbene potrebe stanovalcev. Na drugem mestu je Podil, s povprečnimi ocenami glede dostopnosti izobraževalnih in zdravstvenih ustanov ter zelenih površin in nadpovprečnimi ocenami glede dostopa do trgovin in restavracij. Žuljany je na zadnjem mestu, saj družbena infrastruktura v naselju sploh ni razvita ali je razvita zelo slabo. Naselje ne zagotavlja cenovno dostopnih storitev, kar pomeni, da morajo stanovalci za zadovoljevanje svojih potreb uporabljati druga območja. Najvarnejši stanovanjski območji sta Rusanivka in Žuljany, saj je tam storjenih najmanj kaznivih dejanj na 1.000 prebivalcev na leto. Po navedbah policije je Podil manj varen, saj prostor v soseski uporablja več ljudi. Kljub temu je tam število kaznivih dejanj še vedno precej manjše od mestnega povprečja, zato vsa tri območja veljajo za razmeroma varna.
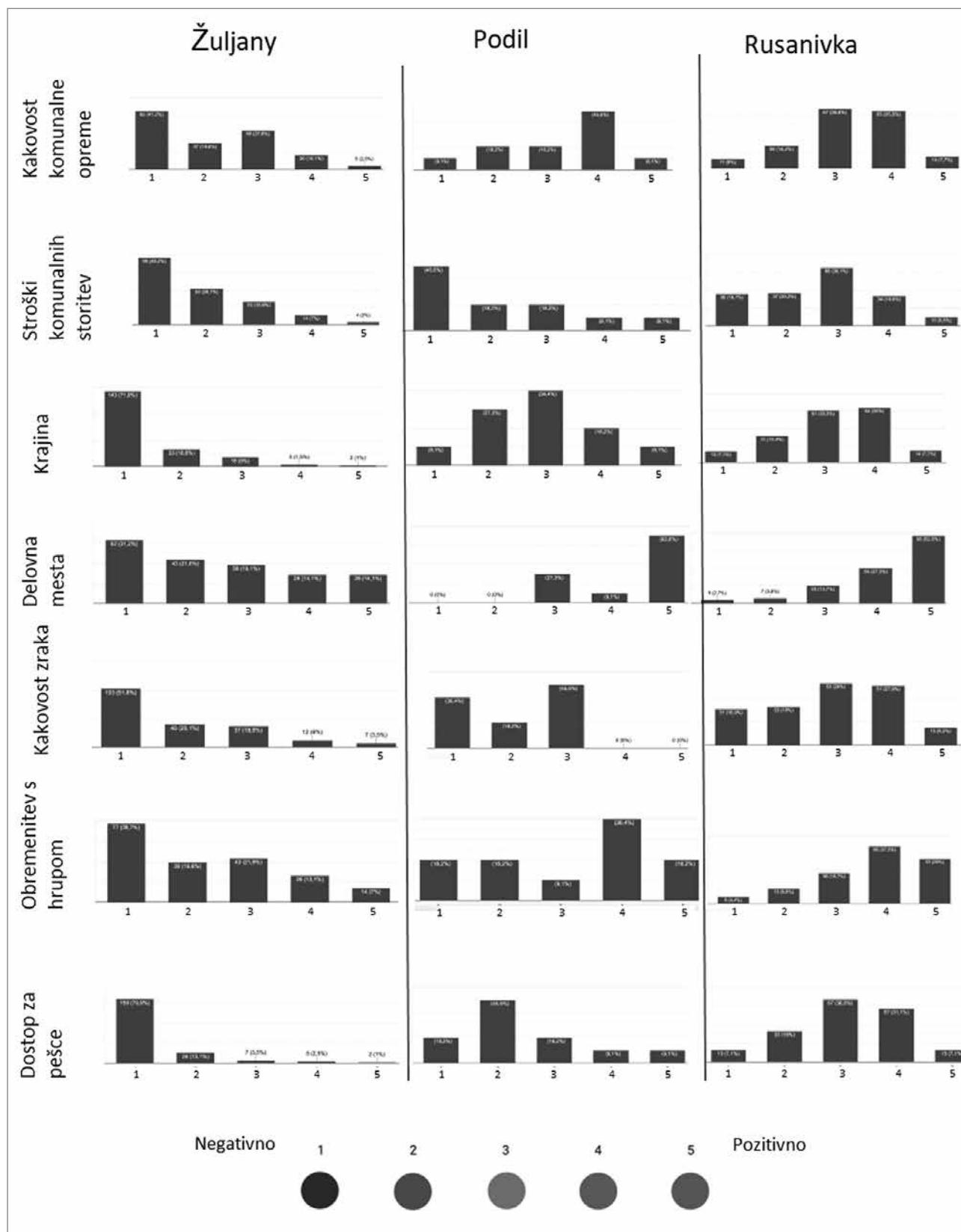
Slika 5: Razlike v kakovosti življenja na podlagi rezultatov ankete, opravljene v proučevanih soseskah v Kijevu (ilustracija: avtorji)

Na podlagi vseh kriterijev so avtorji izračunali skupno oceno za vsako sosesko. Najvišjo oceno (27) je dosegla Rusanivka, kar pomeni, da je bivanje v tej soseski najbolj udobno in kakovostno (preglednica 1). Na drugem mestu je Podil, ki ima visoke vrednosti gospodarskih kazalnikov in ga odlikuje večfunkcionalna raba prostora, hkrati pa je precej onesnažen. Bivalno okolje najslabše kakovosti zagotavlja Žuljany, ki ima slabo razvite družbene in gospodarske funkcije ter nizke vrednosti ekoloških kazalnikov.

4.3 Rezultati ankete

Pri anketiranju prebivalcev proučevanih območij so avtorji analizirali tudi kakovost življenja teh prebivalcev, vpetost v javne aktivnosti in stike s prostorom, na podlagi česar so dobili povprečno oceno tega, kako prebivalci zaznavajo prostor, v katerem živijo.

Anketo je izpolnilo 362 posameznikov. Število izpolnjenih anket v vsaki soseski je bilo skoraj enako, več anket so izpolnile ženske. Anketiranci v Žuljanyju in Rusanivki so bili stari od 25 do 45 let, v Podilu pa je bila večina anketirancev stara med 35 in 45 let. V vseh treh soseskah se 36–43 % prebivalcev vozi na delo drugam. Več kot četrtina prebivalcev Podila dela v domači soseski, v Rusanivki pa je ta delež samo 12 %. Čeprav v Žuljanyju primanjkuje delovnih mest, tam dela 20 % prebivalcev. Precejšen delež anketirancev sploh ne dela ali je na porodniškem ali starševskem dopustu. Pri ocenjevanju kakovosti življenja v vsaki soseski na podlagi vprašalnika so avtorji odkrili nekatere jasne vzorce (slika 5):

- prebivalci Žuljanyja so zelo nezadovoljni s kakovostjo življenja v naselju, kar pomeni, da življenje v njem ni udobno;
- večina prebivalcev Rusanivke je sosesko ocenila kot udobno za bivanje, kar potrjujejo tudi izsledki avtorjev;
- kakovost življenja v Podilu pa so njegovi prebivalci ocenili zelo različno: nekatere parametre so ocenili pozitivno, druge pa negativno.

Analiza javnih aktivnosti in vpetosti prebivalcev v življenje skupnosti je pokazala, da se sosedje med seboj najbolje poznajo v Žuljanyju (90 %), najbolj aktivni pa so prebivalci v Rusanivki, saj jih je kar 41 % sodelovalo v glasovanju glede proračuna za javne projekte. Podil velja za kraj, kjer se ljudje med seboj ne poznajo. Glavni uporabniki tamkajšnjega prostora so podnajemniki, turisti in prebivalci drugih predelov Kijeva. Samo 8 % njegovih prebivalcev je sodelovalo pri glasovanju glede mestnega proračuna.

Pri analizi zaznavanja prostora na podlagi ankete in poglobljenih intervjujev so avtorji ugotovili, da je Rusanivka najprijetnejše območje po mnenju prebivalcev. Vrednosti proučevanih kazalnikov kažejo, da soseska zadovoljuje osnovne potrebe stanovalcev, edina izjema je potreba po zaposlitvi. Prebivalci Žuljanyja so najmanj zadovoljni s svojo okolico in notranjimi procesi v soseski, saj močno primanjkuje osnovnih družbenogospodarskih funkcij in ni trajnega prostorskega razvoja. Za Podil rezultati ankete niso pokazali jasnega mnenja, saj se je izkazalo, da ima soseska v očeh njenih prebivalcev precej nerazločno, neizoblikovano in nejasno podobo.

Kraji, ki so jih prebivalci v glavnem ocenili negativno, ker v njih vzbujajo strah, so v vseh treh soseskah enaki: hrupne avtoceste, natrpani kraji, tržnice in temni kotički (slika 6). Kraji, ki vzbujajo pozitivne občutke (Tuan, 1979), pa so med drugim odprti javni prostori, zelene in vodne površine, zgodovinski kraji in kulturne znamenitosti.

5 Razprava

Raziskava je pokazala nekaj velikih razlik v zaznavanju prostora in vedenjskih vzorcih prebivalcev treh morfološko različnih stanovanjskih območij v Kijevu. Avtorji so na obravnavanih treh območjih proučevali prvine nekaterih osnovnih teorij o zaznavanju prostora in ugotavljali, ali so med dejanskim stanjem in mnenji prebivalcev kakšne večje razlike. Ugotovili so, da nobena od treh izbranih sosesk ni tipična za Kijev, saj je vsaka nastala v drugačnih zgodovinskih okoliščinah, pri čemer ima vsaka drugačno prostorsko ureditev. Žuljany je na primer hibridni vmesni prostor med nekdanjo kmečko vasjo in mestno sosesko. Glavni uporabniki prostora v Podilu niso domačini, ampak turisti, prebivalci drugih predelov Kijeva in podnajemniki. Rusanivka pa ni značilna sovjetska soseska, ampak dobro zasnovan zaprt in prostorsko funkcionalen sistem, ki je še danes lahko za zgled.

Pri strokovni oceni kakovosti življenja v soseskah so avtorji ugotovili, da Rusanivka zagotavlja najbolj udobno bivalno okolje z vseh treh proučevanih vidikov: okoljskega, družbenega in gospodarskega. Skupnost v tej soseski je tudi precej družbeno angažirana in povezana, poleg tega jo zanima izvedba urbanističnih projektov. Podil bi moral biti po teoriji najudobnejši kraj za prebivanje, vendar navedenega pričakovanja ne izpolnjuje v celoti. Uporabnikov prostora v soseski je preveč, živahno nočno življenje pa ne zagotavlja varnosti, ampak prav nasprotno: ta je glavni razlog za višjo stopnjo kriminala.

Zaznavanje prostora so avtorji proučevali na podlagi ankete, poglobljenih intervjujev in oblikovanja spoznavnih zemljevidov, na katerih so v vsaki soseski označili privlačne in neprivlačne kraje. V anketi so sodelovali predvsem stanovalci treh proučevanih sosesk, ki v njih preživijo veliko časa in imajo dobro izoblikovano mnenje o prostoru, v katerem živijo. Rezultati ankete so pokazali, da je lokalnim prebivalcem najprijetnejša

Rusanivka, ki izpolnjuje večino osnovnih potreb svojih stanovalcev. Prebivalci Žuljanja so najmanj zadovoljni z mestnim prostorom, na katerem živijo, in procesi, ki na njem potekajo. Območje je brez osnovnih družbenogospodarskih funkcij in se prostorsko ne razvija. Za Podil pa rezultati ankete niso dali jasne slike. Avtorji so lahko ugotovili samo, da ima soseska po mnenju prebivalcev precej nerazločno, neizoblikovano in nejasno podobo. Mladi, ki so sodelovali v poglobljenih intervjujih, Podil običajno povezujejo z restavracijami, sprehodi po starem delu mesta in nočnim življenjem, Rusanivko z mirnimi in prijetnimi dvorišči ter rečnim obrežjem, Žuljanja pa ne dojemajo kot ločen del mesta. Avtorji so ugotovili, da so bolj jasno podobo o soseski imeli tisti anketiranci, ki so že prej živeli v soseskah podobnega morfološkega tipa in so ob selitvi v Kijev namerno iskali podobnega. Čeprav najemniki v Kijevu običajno niso tako aktivno vključeni v življenje svojih sosesk, imajo globlji vpogled v bivalno okolje kot stanovalci, ki v soseski živijo že od rojstva.

Izbrane soseske so v primerjavi z drugimi v Kijevu edinstvene, zato rezultatov raziskave ni mogoče posplošiti na podobne soseske v Kijevu ali drugih ukrajinskih mestih. Zgodovinske okoliščine so ključne tako pri vrednostih kazalnikov kakovosti življenja kot za mnenja prebivalcev o izbranih morfoloških tipih sosesk. Poznavanje prostora in sodelovanje pri njegovi preobrazbi sta neposredno odvisna od prejšnjih izkušenj prebivalcev in njihovega razumevanja razmer na območju, na katerem živijo. Na podlagi objektivnih kazalnikov in mnenj prebivalcev so avtorji ugotovili, da najudobnejše bivalno okolje zagotavlja sovjetska stanovanjska soseska Rusanivka, kar se ne ujema s splošno sprejetimi teorijami o najbolj vzornih in najprivlačnejših morfoloških tipih stanovanjske gradnje. Primer Rusanivke kaže, da je treba pri sprejemanju urbanističnih odločitev ne glede na politične razmere, zgodovinske okoliščine in obliko stavb dati prednost rešitvam, ki se osredotočajo na človeka, premišljenim celostnim načrtovalskim pristopom in zadovoljevanju potreb stanovalcev, povezanih z druženjem, udobjem in razpoložljivostjo storitev. Poleg tega je treba posebno pozornost nameniti prostorom in krajem, ki jih ljudje uporabljajo vsak dan.

6 Sklep

Čeprav so avtorji ponudili nekaj odgovorov na vprašanja, povezana s kakovostjo življenja v treh soseskah v Kijevu, so na tem področju potrebne nadaljnje raziskave. Soseske v Kijevu bi bilo treba primerjati s soseskami v drugih ukrajinskih mestih ter proučiti, ali so na primer v Harkovu, Dnepru in Odesi podobne soseske in poslovna območja. Ugotoviti bi bilo tudi treba, ali starejši, prebivalci srednjih let in mladi v ukrajinskih mestih različno zaznavajo prostor. Predvsem pa bi se morale raziskave osredotočiti na to, kako bi bilo treba obnoviti ukrajinska mesta
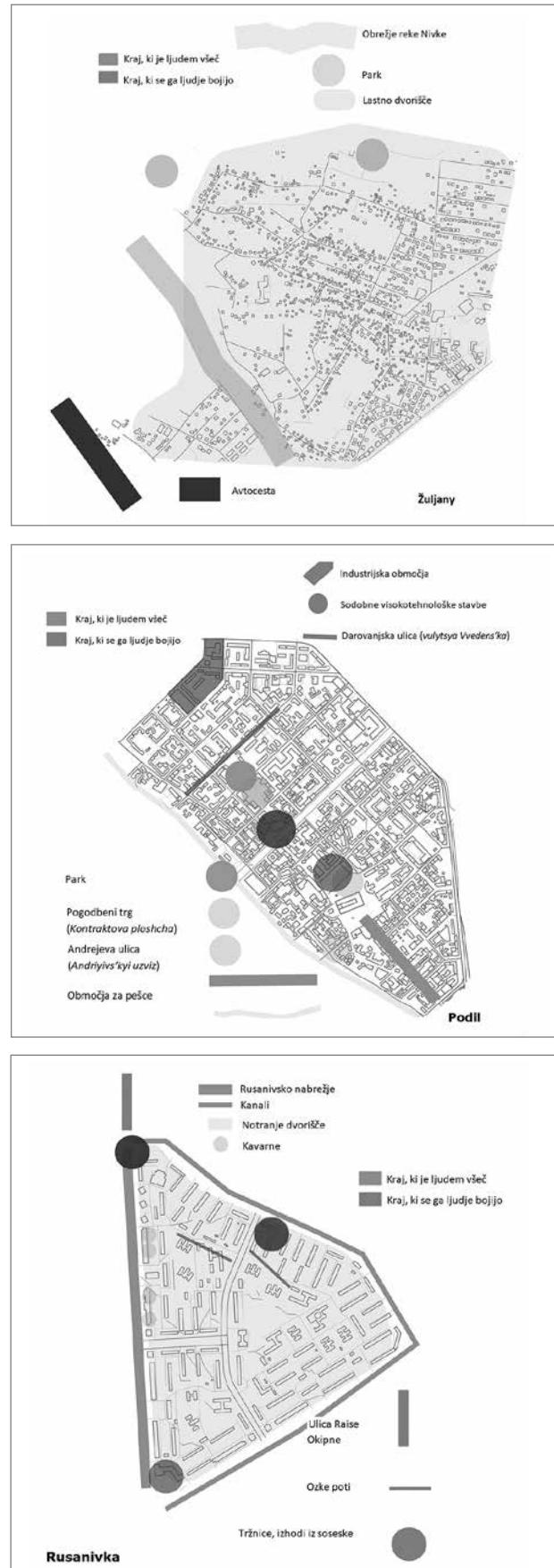
Slika 6: Primerjava spoznavnih zemljevidov, ki prikazujejo prostorske zaznave prebivalcev proučevanih sosesk v Kijevu (vir: avtorji)

po koncu vojne z Rusijo, ki se je začela z ruskim napadom februarja 2022. Ali bo obnova temeljila na kaotičnih neoliberalnih posegih, katerih edini cilj je zadovoljiti gospodarske koristi investitorjev, ali na pozitivnih izkušnjah sovjetskega načrtovanja stanovanjskih sosesk, pri čemer bo celoten proces bolj fleksibilen, usmerjen v doseganje želenih vplivov urbane prenove in bo upošteval potrebo po sodelovanju javnosti pri odločanju? Po vojni bo zagotovo potekala takšna ali drugačna obnova, geografi, družboslovci, arhitekti in urbanisti pa bodo morali razmisliti o tem, kateri so njeni cilji in želeni rezultati.

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Alexandros BARTZOKAS-TSIOMPRAS

Kje bi bilo treba izboljšati območja za pešce? Razvrščanje in kartiranje posegov za izboljšanje ulične hodljivosti v središču Cape Towna

Prostorsko urejanje območij za pešce, ki zagotavlja bolj zdravo in vključujočo ulično krajino, je lahko močan mehanizem za izboljšanje varnosti in udobnosti pešačenja v afriških mestih. Avtorja v članku predlagata pristop k analizi hodljivosti na več prostorskih ravneh, s katerim se lahko določijo ulice, primerne za pešce, in problematična območja, ki zahtevajo manjše izboljšave (npr. popravilo pločnikov, boljše vzdrževanje stavb ter ureditev ulične razsvetljave in javnih klopi). Raziskovalni okvir, ki temelji na uporabi GIS, sta uporabila za središče Cape Towna v Južni Afriki, ki se spopada s kompleksnimi družbenimi in okoljskimi izzivi. Za vsak segment ulice s prehodom za pešce sta z orodjem za virtualno presojo območij za pešce zbrala podatke o okoljskih kazalnikih na mikro- in mezoravni ter proučila kakovost javnega prostora. Rezultate, dobljene z navedenim sestavljenim orodjem za presojo ulic, sta pomnožila z normalizirano vrednostjo mere prostorske sintakse (tj. integracije), na podlagi česar sta določila poti v mreži, ki so med seboj najbolj povezane in najbolj potrebne prenove. Z Jenksovo metodo naravnih mej sta razvrstila rezultate za vsak segment, na podlagi česar sta ugotovila, da so ulice, ki so najbolj potrebne prenove, zgoščene v Bo-Kaapu, razmeroma slabo razvitem, večkulturnem in hribovitem predelu v zahodnem delu Cape Towna. Na koncu sta predstavila priporočila za izboljšanje kakovosti mestnega okolja in splošne privlačnosti mesta za pešce. Predlagana metodologija omogoča učinkovitejše upravljanje krajev in razvrščanje potreb mesta po izboljšavah, s čimer se zmanjšajo stroški in poraba časa.

Ključne besede: hodljivost, mobilnost pešcev, grajeno okolje, Google Street View, Cape Town

1 Uvod

Urejanje sistemov mobilnosti, ki krepijo zdravje, ter bolj hodljivih ali pešcem prijaznejših in vključujočih ulic je ključno za boljši trajnostni razvoj mest in njihovo večjo privlačnost za bivanje (Loo, 2021). *Hodljivost* je krovni pojem, ki se nanaša na kakovost grajenega okolja ter njegovo primernost in privlačnost za hojo (Forsyth, 2015). Pojem je pritegnil precejšnjo pozornost raziskovalcev, ki so med drugim potrdili njegovo povezanost z javnim zdravjem (npr. telesno aktivnostjo, debelostjo, visokim krvnim tlakom in rakom) (Sallis idr., 2016; Cerin idr., 2022), onesnaženostjo zraka (Marshall idr., 2009), enakopravnim dostopom do prometne infrastrukture in odvisnostjo od avtomobilov (Knight idr., 2018) ter nepremičninskimi trgi (Trichês Lucchesi idr., 2020). Presoja hodljivosti je torej dobra metoda za merjenje vpliva politik mestne mobilnosti in prostorskega načrtovanja na pešce.

Merjenje hodljivosti je zahtevna naloga ter vključuje najrazličnejše metode in podatkovne nize. Fonseca idr. (2022) omenjajo 32 atributov grajenega okolja, ki vplivajo na hodljivost, in 63 kazalnikov, povezanih z rabo prostora, dostopnostjo, povezanostjo ulične mreže, površinami za pešce, udobnostjo pešačenja, varnostjo pešcev in obliko ulične krajine. Cervero in Kockelman (1997) pa sta predlagala 3D-koncept (gostota, raznolikost in oblika), ki je bil podlaga za oblikovanje številnih kazalnikov, ki so temeljili na GIS in so bili sestavljeni iz raznih spremenljivk na ravni sosesk, kot so gostota prebivalcev, mešana raba prostora, gostota križišč in delež storitvenih površin glede na preostale dejavnosti (glej npr. aplikacijo za hodljivost, ki so jo razvili Frank idr., 2010). Cerin idr. (2022) so ugotovili, da ljudje, ki živijo v soseskah z več kot 5.700 stanovalci, sto križišči in 25 postajališči javnega prometa na kvadratni meter, pogosteje hodijo, bodisi da pridejo na želeni kraj bodisi za rekreacijo. Poleg tega je nedavna raziskava, opravljena v 21 različno razvitih državah, pokazala dosledno povezavo med zaznanimi značilnostmi grajenega okolja in pešačenjem, proučevani dejavniki so vključevali raznolikost rabe prostora, dostop do raznih vrst rabe prostora in povezanost ulic (Boakye idr., 2023). Koohsari idr. (2019) so predlagali podatkovno neintenzivno mero hodljivosti, ki temelji na prostorski skladnji oziroma integraciji (tj. mestni obliki) in gostoti prebivalcev (tj. mestni funkciji). Bartzokas-Tsiompras in Bakogiannis (2022) sta na 121 evropskih metropolitanskih območjih proučevala zamisel o mestu, ki zagotavlja 15-minutni peš dostop do osnovnih storitev, pri čemer sta uporabila primerljive kazalnike peš dostopa do sedmih destinacij (šol, trgovin s hrano, centra mesta, območij za rekreacijo, restavracij, zelenih površin in bolnišnic) in večkriterijski pristop PROMETHEE II. Nekateri raziskovalci za merjenje zaznanih ravni hodljivosti uporabljajo ankete z vprašalniki, kot je Neighbourhood Environment Walkability Scale (Adams idr., 2009), drugi pa se osredotočajo na proučevanje virtualne ali resnične ulične krajine (Brownson idr., 2004), da bi pridobili podatke o značilnostih, na katere ima lahko prostorska politika večji vpliv (npr. prehodih za pešce, pločnikih, stavbah, ulični razsvetljavi, estetiki in strahu pred kriminalom).

Raziskave hodljivosti v Afriki so še vedno redke (Lofti in Koohsari, 2011; Ramakreshnan idr., 2021), zajemajo samo 1,5 % svetovne strokovne literature o hodljivosti (Hasan idr., 2021), čeprav Afričani za pešačenje ali kolesarjenje v povprečju na dan porabijo več časa (55 min) kot pa drugi ljudje po svetu (43,9 min) (UN-Habitat, 2022: 13). Izsledki dosedanjih afriških raziskav hodljivosti so pokazali, da na pešačenje v Afriki vplivajo drugačni okoljski dejavniki kot v severnoameriških ali evropskih mestih. Na to, kako prebivalci afriških mest zaznavajo varnost v prometu, na primer vpliva to, da večinoma pešačijo na delo ali gredo po opravkih peš, zato so navajeni nevarnih in natrpanih cest ter se jih ne bojijo. Od pešačenja jih odvrača zlasti strah pred kriminalom (Oyeyemi idr., 2017). Oyeyemi idr. (2017) poleg tega navajajo, da prostorska kakovost ljudi ne spodbuja k pogostejšemu pešačenju, saj imajo Afričani na splošno nizka pričakovanja glede privlačnosti javnih prostorov. Študija, opravljena v Akri v Gani, je pokazala pozitivno povezavo med zaznano hodljivostjo in prodružbenem vedenjem (npr. vedenjem, prijaznem okolju, in družbeno odgovorno potrošnjo). Bolje ko mestni prebivalci poznajo trajnostne prakse, močnejša je ta povezava (Opuni idr., 2022).

Razvrščanje posegov na območjih za pešce po pomembnosti še naprej priteguje pozornost raziskovalcev po svetu, saj lahko že manjše izboljšave v ulični mreži skrajšajo čas hoje in izboljšajo trajnostno mobilnost v mestih (Delso idr., 2017, 2018). Ciljna naravnanost naložb v infrastrukturo za pešce zagotavlja, da so sredstva učinkovito porabljena (D'Orso in Migliore, 2020). Uporaba orodij GIS pri proučevanju hodljivosti se je izkazala za uspešno pri oblikovanju geografsko pomembnih metodologij za opisovanje cestnih omrežij (Delso idr., 2017, 2018; Ortega idr., 2021). V tem okviru se lahko analizira tudi primernost mestnih ulic za pešačenje. Analiza vključuje bližino in povezanost ulične mreže s številnimi spremenljivkami, ki se nanašajo na površine za pešce, na njeni podlagi pa se lahko oblikujejo metodologije za določanje uličnih segmentov, ki bi jih bilo treba izboljšati (Delso idr., 2019). Tovrstne metodologije zagotavljajo podatke o tem, na katerih mestnih predelih je treba izboljšati prvine grajenega okolja, kot so ulična oprema ali površine za pešce (Delso idr., 2017), da bi se povečala mobilnost v mestu (Ortega idr., 2021). Podobno analize primernosti površin za kolesarjenje temeljijo na odprto dostopnih podatkih o dejavnikih, ki vplivajo na izbor poti (npr. omejitev hitrosti, naklon in vrsta kolesarske poti) (Wysling in Purves, 2022). Šibkost omenjenih metod je, da morda ne upoštevajo

Slika 1: Proučevano območje (ilustracija: Alexandros Bartzokas-Tsiompras)

rezultatov proučevanja prvin infrastrukture za pešce in javnega prostora ter da morda niso zadostne za oblikovanje izvedljivih, ciljnih ukrepov za izboljšanje ulic.

Avtorja v članku zato predlagata mešani geografski metodološki pristop k razvrščanju posegov za izboljšanje mobilnost pešcev in mestnih oblik po pomembnosti in njihovemu kartiranju. Pristop združuje nekatere najpomembnejše prvine mestnega grajenega okolja, vključno z okoljskimi dejavniki na mikroravni, ki jih je razmeroma lahko spremeniti, in povezanostjo ulic, na katero pa je težje vplivati. Rezultat opisanega pristopa je presoja primernosti uličnega segmenta (PUS), ki izraža, koliko lahko pešci uporabljajo ulico (tj. kako primerna je za udobno pešačenje). Avtorja nato vrednost PUS za vsak ulični segment odštejeta od vrednosti njegove prostorske integracije, na podlagi česar dobita vrednost indeksa nujnosti prenove ulice (NPU). Višja ko je vrednost NPU, več dela je treba vložiti v vzdrževanje, obnovo ali izboljšavo. Ker v nasprotju z mesti na globalnem severu za mnoga afriška mesta primanjkuje poglobljenih raziskav s področja mobilnosti, sta avtorja za študijo primera izbrala južnoafriško prestolnico Cape Town.

2　Proučevano območje: Cape Town

Cape Town je prestolnica in drugo največje mesto Republike Južna Afrika, v katerem je leta 2021 živelo približno 4,68 milijona ljudi (City of Cape Town, 2022). V zadnjih desetletjih mesto zaradi priseljevanja s podeželja doživlja precejšnjo urbano rast. Zaradi zgodovine, povezane z apartheidom, je v mestu še vedno precej družbeno-prostorskih neenakosti, ki krepijo družbeno-prostorsko ločevanje, revščino in izključenost (Lloyd idr., 2021). Med letoma 1980 in 2000 se je število prebivalcev Cape Towna podvojilo (Western, 2002), nato je do leta 2010 vsako leto enakomerno naraščalo za 3,3 %, od leta 2010 pa letna rast znaša 1,5 % (Scheba idr., 2021). Med letoma 1998 in 2019 se je površina mesta s 625 km² povečala na 679 km² ali za samo 8,7 % (Scheba idr., 2021), kar je razlog za čedalje večjo gostoto pozidave, o kateri poročajo mnogi raziskovalci (Horn, 2018; Scheba idr., 2021). Cape Town je eno izmed prometno najbolj obremenjenih mest v Afriki, zlasti ker je mobilnost v mestu zelo slabe kakovosti. Zaradi neučinkovitega in nevarnega omrežja javnega potniškega prometa z gostoto približno 2 km/km² (UN-Habitat, 2013) večina prebivalcev (tj. 60 %) potuje z avtom, pešači pa jih samo 4 % (Deloitte,
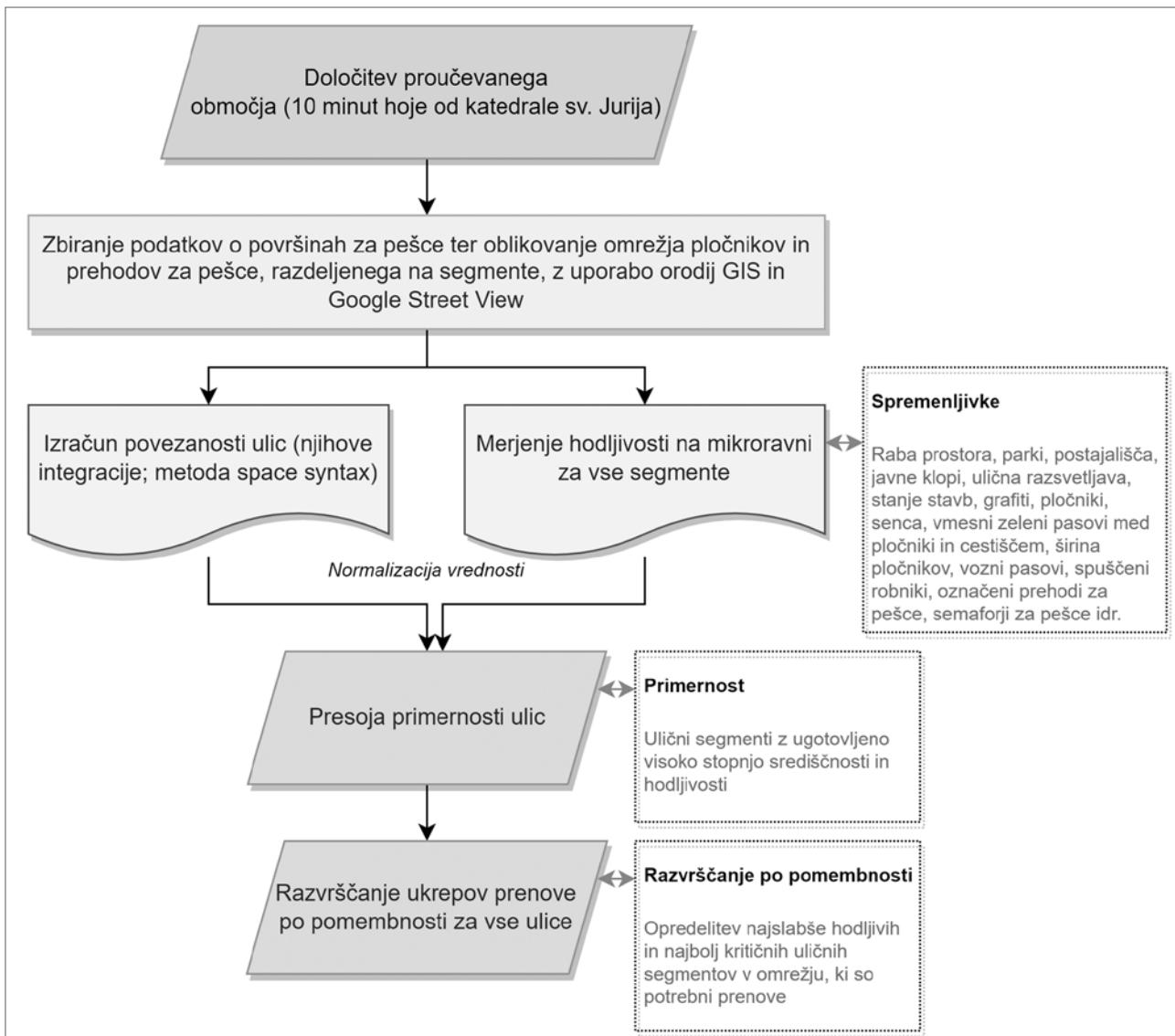
Slika 2: Predlagana metodologija (ilustracija: avtorja)

2019). Kljub obsežnemu omrežju kolesarskih poti (približno 450 km) je delež kolesarjev manjši od 1 %. S 7 km con za pešce ima Cape Town četrto največje omrežje območij za pešce v Afriki (ki pa je v svetovnem merilu še vedno majhno) (Bartzokas-Tsiompras, 2022).

Mestno tkivo Cape Towna je sestavljeno iz kolonialne ulične mreže in sosesk, ki se nenačrtno širijo v okolico (Wilkinson, 2000). Mesto polovico energije porabi za promet (v mnogih evropskih mestih ta delež znaša približno eno četrtino) (UN-Habitat, 2013). Zapleteni urbani sistem je posledica nekdanjih družbenih in prostorskih politik (Ordor in Michell, 2022), zlasti prostorskih neenakosti, ki so mesto razdeljevale med apartheidom v prejšnjem stoletju (Odendaal in McCann, 2016). Apartheid je temnopolte afriške mestne prebivalce prisilil v prebivanje na ločenih stanovanjskih območjih s hišami slabe kakovosti ter slabo razvito prometno infrastrukturo in

javnimi storitvami (Gibb, 2007). Apartheidska prometna politika je bila oblikovana tako, da je zmanjševala povezanost med območji in ljudi odvračala od aktivne mobilnosti. Značilen primer nekdanjih ločenih sosesk je Bo-Kaap, eden izmed najstarejših predelov Cape Towna, ki je zahodno od mestnega središča. Je središče malajske muslimanske skupnosti v Južni Afriki. Za območje je danes značilna gentrifikacija, pri čemer se zaradi prenovljenih in boljših stanovanj višajo cene nepremičnin, prvotni stanovalci pa se odseljujejo (Kotze, 2013).

Avtorja sta za raziskavo izbrala območje okoli katedrale sv. Jurija, ki je na pomembni lokaciji v mestnem jedru in poslovnem središču Cape Towna (Gibb, 2007). Kot je razvidno s slike 1, območje raziskave zamejuje desetminutna izohrona od katedrale, pri čemer je bila pri izračunu desetminutne peš razdalje upoštevana dejanska oblika uličnega omrežja in ne ravna črta (Boisjoly idr., 2018).

3 Gradivo in metode

Cilj predlagane metode je pomagati urbanistom in odločevalcem pri razvrščanju naložb v urejanje pešcem prijaznejših ulic po pomembnosti na podlagi proučitve urbanističnih omejitev za tovrstne površine (Wood, 2022). Metoda združuje različne vidike grajenega okolja, pri čemer se osredotoča na prostorsko sintakso in parametre hodljivosti na mikroravni. Podatki se zbirajo na podlagi opazovanja virtualnih površin za pešce v spletni aplikaciji Google Street View. Novi ulični kazalniki za središče Cape Towna in uporabljena metoda ocenjevanja ponujajo alternativen način merjenja in kartiranja problematičnih javnih prostorov, nujno potrebnih prenove, ki je izvedljiva in stroškovno učinkovita. Postopek je na kratko predstavljen na sliki 2.

3.1 Povezanost ulic (skladenjska mera integracije)

Kot navajajo Su idr. (2019), lahko povezanost opišemo kot stopnjo medsebojne povezanosti poti v okviru omrežja in stopnjo povezav različnih smeri med izhodišči in destinacijami. Avtorja v članku povezanost proučujeta na podlagi teorije prostorske sintakse, pri kateri se uporabljajo topološki pristopi k analizi gibanja pešcev skozi javni prostor (Hillier idr., 1993). Analiza prostorske sintakse lahko vključuje najrazličnejše parametre, raziskave (npr. Hillier idr., 1987, 1993) pa so pokazale, da je najpomembnejša mera prostorske skladnje integracija. Integracija je topološka mera središčnosti, ki izraža povprečno število sprememb smeri, potrebnih za premik od enega kraja k vsem drugim krajem. Ne meri razdalje v metrih, ampak izraža predvsem prostorsko globino. Z drugimi besedami, kot navajajo Koohsari idr. (2019), integracija izraža dostopnost uličnega segmenta do vseh drugih uličnih segmentov na posameznem območju in omogoča oceno tega, koliko ljudi bo najverjetneje v posameznem prostoru. Visoka vrednost integracije pomeni, da je segment dobro povezan, nizka vrednost pa pomeni, da je segment nepovezan ali izoliran (Hillier in Hanson, 1984). Ker je območje raziskave vključevalo več sosesk, sta avtorja vrednost integracije izračunala v radiju 250 m okoli vsakega uličnega segmenta. Za izračun sta uporabila spletno orodje QGIS Space Syntax Toolkit (https://plugins.qgis.org/plugins/esstoolkit/). To je vtičnik, ki se uporablja za analize prostorskih mrež in statistične analize ter omogoča uporabniku prijazno analizo prostorske sintakse v okolju GIS.

3.2 Okvir hodljivosti ulic

Za proučevanje ulic sta avtorja izbrala malce spremenjeno različico orodja Microscale Audit of Pedestrian Streetscapes (MAPS-Mini) (Sallis idr., 2015). Osnovna različica orodja vse-buje petnajst postavk (večinoma vprašanj tipa da/ne in vprašanj, ki se nanašajo na to, kako pogosto se posamezno območje uporablja) za proučevanje značilnosti prehodov za pešce, dejanske rabe prostora, dostopa do parkov ali trgov in postajališč javnega prometa, javnih klopi, jakosti javne razsvetljave, stanja stavb, grafitov, prisotnosti pločnikov, vmesnih zelenih pasov med pločniki in cestiščem, kolesarskih stez in sence (Geremia in Cain, 2015). Ameriški raziskovalci so potrdili veljavnost skupnih rezultatov osnovne različice orodja MAPS-Mini, saj so pri vseh starostnih skupinah pokazali pozitivno in statistično značilno povezavo med ocenjevanimi prvinami ulične krajine in aktivno mobilnostjo (Sallis idr., 2015). Evropski raziskovalci pa so orodje MAPS-Mini uporabili za kartiranje in merjenje privlačnost ulic za pešačenje in neenakosti v hodljivosti kot posledice neustreznega urbanističnega oblikovanja (Bartzokas-Tsiompras idr., 2020, 2021; Bartzokas-Tsiompras in Photis, 2021).

Avtorja sta v raziskavi osnovni različici orodja dodala še štiri spremenljivke, da bi pridobila podatke na mikroravni, ki so pomembni za Cape Town in morebitne projekte ulične prenove. Prva dodana spremenljivka se nanaša na dostopnost pločnikov (S9_1) in na to, ali so prekinjeni ali ne, druga pa se nanaša na širino pločnikov (S13). Prekinjenost oziroma neprekinjenost in širina pločnikov namreč vplivata na stopnjo udobja med pešačenjem. Tretja dodatna spremenljivka je povezana z značilnostmi cest in številom voznih pasov (S14), kar je ključni parameter pri projektih zoževanja in urejanja cest. Četrta dodatna spremenljivka pa se nanaša na živahnost ulic, pri čemer sta avtorja opazovala prisotnost nakupovalnih con za pešce (S15) in ugotavljala, ali je posamezni ulični segment del izključno nakupovalne cone za pešce.

Za opazovanje ulic sta avtorja v postopku 15-dnevnega ocenjevanja uporabila kombinacijo orodij GIS in Google Street View (Lee in Talen, 2014). Vsak ulični segment sta virtualno proučila na podlagi posnetkov iz leta 2015 ali 2017 (odvisno od razpoložljivosti), pri čemer je zadostovalo, da je rezultat v podatkovno bazo GIS (različico ArcGIS 10.3) vnesel samo en opazovalec (tj. prvi avtor). Pri vsakem segmentu sta vsaki izmed 19 opazovanih spremenljivk dodelila 0 točk ali pa 1 točko, nekatere spremenljivke so lahko dobile tudi 2 točki. Šestnajst spremenljivk se nanaša na ulični segment, preostale pa na prehod za pešce (glej sliko 3). Skupno sta ocenila 1.025 uličnih segmentov v skupni dolžini približno 78,6 km. V preglednici 1[1] so na kratko predstavljene vse spremenljivke in njihove ocene (število doseženih točk).

Skupno oceno hodljivosti (SOH) za vsak ulični segment in prehod za pešce sta avtorja dobila tako, da sta seštela točke vseh spremenljivk, vsoto pa sta nato delila z največjim možnim

Slika 3: Primer uličnega segmenta in prehoda za pešce (vir: Google Street View; ilustracija: avtorja)

številom točk (26), ki ga je ocenjeni segment lahko prejel. Uporabila sta naslednjo enačbo:

$$SOH = \frac{\sum_{i=0}^{19} x_i}{26} \quad , (1)$$

kjer je SOH skupna ocena hodljivosti, x_i pa je spremenljivka posameznega segmenta.

Vrednost SOH je med 0 in 1, pri čemer 0 pomeni najslabšo hodljivost, 1 pa najboljšo.

3.3 Primernost uličnega segmenta

Potem ko sta avtorja izračunala vrednosti povezanosti (prostorske integracije) ulic in presoje hodljivosti, sta jih v naslednjem koraku pomnožila. Pred tem sta z normalizacijo min-max brezdimenzijske vrednosti pretvorila v vrednosti od 0 do 1. Končni rezultat, primernost uličnega segmenta (PUS), je odvisen od tega, ali so začetne vrednosti prostorske integracije in hodljivosti enake ali manjše od normalizirane vrednosti prostorske integracije. Kombinacija navedenih dejavnikov pokaže dejansko stanje infrastrukture za pešce (Delso idr., 2019). Avtorja sta uporabila naslednjo enačbo:

$$PUS_i = x_i \cdot y_i \quad (2)$$

kjer je PUS primernost uličnega segmenta, x_i je normalizirana vrednost prostorske integracije in y_i je normalizirana vrednost hodljivosti (SOH).

3.4 Nujnost ulične prenove

Zadnji korak predlagane metode vključuje določitev in kartiranje nujnosti ulične prenove (NUP). Avtorja sta vrednost NUP dobila tako, da sta presojo primernosti vsakega uličnega segmenta odštela od vrednosti prostorske integracije, ki izraža središčnost posamezne ulice. Končni rezultat je razlika med dejanskim in idealnim okoljem za pešce, iz katere je razvidna potreba po posegih za izboljšanje mobilnosti pešcev. Večja ko je vrednost NUP, dlje je ulica od idealnih razmer (ki jih izraža normalizirana vrednost prostorske integracije). Avtorja sta nazadnje določila ulične segmente, najbolj potrebne prenove (tj. prvi kvantil), in jih prerazporedila v tri kategorije. Pri tem sta uporabila Jenksovo metodo naravnih mej, saj daje večji poudarek nizkofrekvenčnim podatkom. Tako sta določila območja z najvišjo vrednostjo NUP, za katera so potrebni takojšnji posegi za izboljšanje površin za pešce. Imenovala sta jih ulični segmenti, ki potrebujejo takojšnjo prenovo (USTP). Uporabila sta naslednjo enačbo:

$$NUP_i = x_i - PUS_i \quad , (3)$$

kjer je NUPi nujnost ulične prenove, xi je normalizirana vrednost prostorske integracije, PUSi pa je primernost uličnega segmenta.

4 Rezultati

Skupni rezultati za zbrane podatke o vseh spremenljivkah na mikroravni so navedeni v preglednici 2[2]. Dostop do postaja-
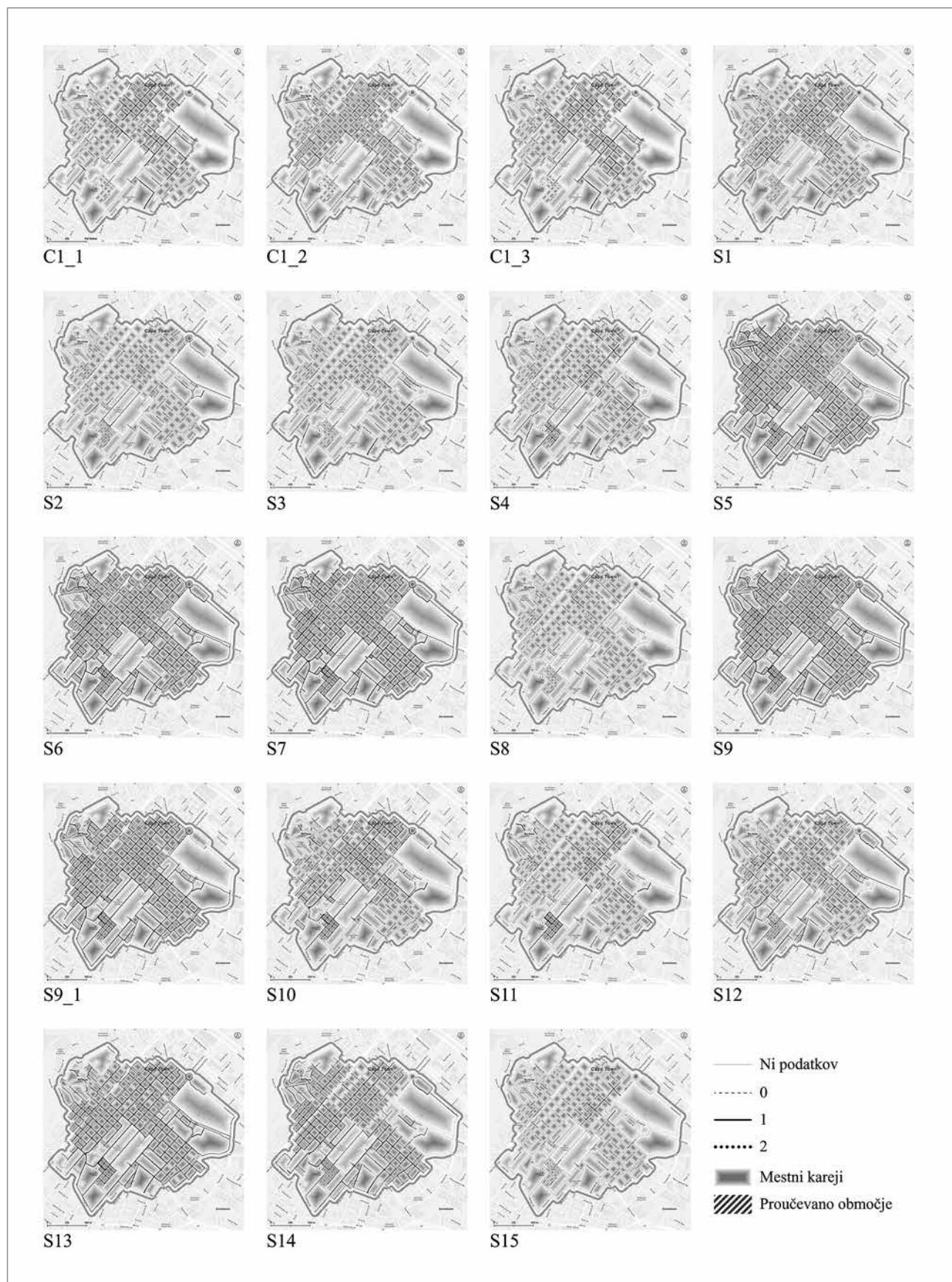
Slika 4: Karte uličnih segmentov in prehodov za pešce za vsako spremenljivko (ilustracija: avtorja)

lišč javnega prometa (S3 = 6,5 %) in javnih klopi (S4 = 14,2 %) je v večjem delu mesta omejen. Razširjenost javne razsvetljave (S5 = 96,7 %) in pločnikov (S9 = 93,5 %) po celotnem mestnem središču, zadovoljivo vzdrževane stavbe (S6 = 81,6 %), dovolj široki pločniki (S13 = 74,8 %), odsotnost grafitov (S7 = 92,3 %) in večinoma enopasovne ceste (S14 = 39 %) spadajo med pozitivne prvine hodljivosti. Pri prehodih za pešce pa se je izkazalo, da mesto nima dovolj semaforjev za pešce (nameščeni so na samo 32,2 % prehodov), spuščenih robnikov na pločnikih (ima jih 52,9 % prehodov) in označenih prehodov (39,3 %), kar pomeni, da je še veliko prostora za izboljšave.

Kot je razvidno s slike 4, je večina dejavnosti (S1) zgoščenih v poslovnem središču mesta severovzhodno od katedrale sv. Jurija. Največ parkov (S2) in javnih klopi (S4) je severovzhodno in jugozahodno od mestnega središča. Večina postajališč javnega prometa (S3) je proti vzhodu, na velikih avenijah (npr. Strand Street). Največ slabo osvetljenih ulic (S5), stavb, porisanih z grafiti (S7), in ulic brez pločnikov (S9) je v zahodnem in severozahodnem delu Bo-Kaapa. Podobno velja za spremenljivki, ki se nanašata na stanje stavb (S6) in neprekinjenost pločnikov (S9_1), saj je večina propadajočih stavb in prekinjenih pločnikov na zahodu (tj. v Bo-Kaapu). Kolesarske steze (S8) so redke, razen v poslovnem središču mesta severovzhodno od katedrale. Kakovostni pločniki (S10) in vmesni zeleni pasovi med pločniki in cestiščem (S11) so značilni za območje okoli katedrale, problematični odseki pločnikov pa so pogosti v vzhodnih in zahodnih mestnih predelih. Bolj senčni pločniki (S12) in ulice z manj kot dvema prometnima pasovoma (S14) so razpršeni po celotnem proučevanem območju, preozki pločniki (tj. ožji od dveh metrov) (S13) pa so značilni zlasti za zahodni del Bo-Kaapa. Izključno nakupovalne cone za pešce (S15) so v mestnem središču redke, te so samo severovzhodno od katedrale (St. George's Mall Street). Mnogo prehodov za pešce je na severu in vzhodu proučevanega območja. Jasno pa je, da je največ nevarnih in neustreznih prehodov na zahodu in jugovzhodu, v predelih Bo-Kaap in Zonnebloem.

Na sliki 5 so predstavljene vrednosti prostorske integracije in SOH. Vrednosti integracije so neposredno povezane z geometrijo ulične mreže, pri čemer so višje vrednosti zgoščene v treh ločenih gručah severno, zahodno in severozahodno od katedrale sv. Jurija. Najvišje vrednosti SOH so vzdolž osi, ki poteka skozi katedralo v smeri od severovzhoda proti jugozahodu. Večina najnižjih vrednosti SOH je v severozahodnem delu središča Cape Towna (Bo-Kaap), na lokaciji z najvišjimi vrednostmi povezanosti ulic.

Karta vrednosti PUS (slika 6) kaže, da so najprimernejši segmenti ulic za pešce večinoma severovzhodno in jugozahodno od katedrale, kjer so tudi vrednosti hodljivosti najvišje. Visoke vrednosti PUS so značilne tudi za več območij v zahodnem

delu mestnega središča. Velika gruča visokih vrednosti PUS je okoli trga Greenmarket Square, živahnega mestnega vozlišča samo tri ulice severovzhodno od katedrale sv. Jurija. Še ena manjša gruča visokih vrednosti PUS je severozahodno od katedrale, v parku med Južnoafriškim muzejem Iziko, Južnoafriško narodno galerijo in Južnoafriškim judovskim muzejem.

Avtorja sta nato izračunala vrednost indeksa NUP, in sicer tako, da sta od normaliziranih vrednosti prostorske integracije odštela vrednosti PUS. Območja z najvišjimi vrednostmi NUP so v vzhodnem delu mesta, to so segmenti ulic, ki so potrebni takojšnje prenove. Dve ločeni območji z visokimi vrednostmi NUP (ter zmernimi do nizkimi vrednostmi PUS in zelo visokimi vrednostmi prostorske integracije) sta v predelu Bo-Kaap. Manjše območje z visokimi vrednostmi NUP je poleg tega na jugovzhodu (slika 7). Segmenti z najvišjimi vrednostmi NUP se ujemajo z najbolj degradiranimi predeli proučevanega območja.

Da bi avtorja izračunala vrednost USTP, sta kvantil z najvišjo vrednostjo NUP (tj. prvi kvantil) z uporabo Jenksove metode naravnih mej prerazporedila v tri razrede ali kategorije. V prvo kategorijo spadajo najbolj kritični ulični segmenti, na katerih je infrastruktura za pešce najbolj potrebna izboljšav. Kot je bilo pričakovano, so najvišje vrednosti USTP zgoščene v zahodnem delu mestnega središča in v predelu Bo-Kaap.

Za boljše razumevanje stanja ulic so na sliki 8 prikazani trije primeri uličnih segmentov, po eden za vsako kategorijo USTP. Za vsakega sta značilni visoka vrednost prostorske integracije in slaba primernost za pešačenje zaradi razmeroma nizke vrednosti SOH.

Primer a (ulica Bryant Street) spada v prvo kategorijo USTP. Manjka večina spremenljivk ulične krajine. Ni primerno urejenih prehodov za pešce, stavbe in pločnik pa so v slabem stanju. Na pločniku ni sence, med njim in cesto ni vmesnega zelenega pasu, poleg tega na ulici ni postajališč javnega prometa, trgovin v pritličju stavb, kolesarskih stez, parkov in javnih klopi. Vsi ti dejavniki prispevajo k nizki vrednosti SOH. Podobno velja za primer b (ulico Buitengracht Street), samo da ima ta ulični segment bolje vzdrževane stavbe in ustrezno javno razsvetljavo, zaradi česar je vrednost SOH tam rahlo višja. Avtorja sta ga zato uvrstila v 2. kategorijo USTP. Zadnji primer (ulica Jordaan Street) ima nekoliko nižjo vrednost prostorske integracije kot prva dva primera, zaradi nizke vrednosti SOH pa je razlika med vrednostjo njegove prostorske integracije in primernostjo za pešačenje dovolj velika, da sta ga avtorja uvrstila v 3. kategorijo nujnosti takojšnje prenove.

Avtorja sta v študiji primera določila ulične segmente, ki nimajo kakovostnih površin za pešce. Po razvrstitvi ulic v ka-
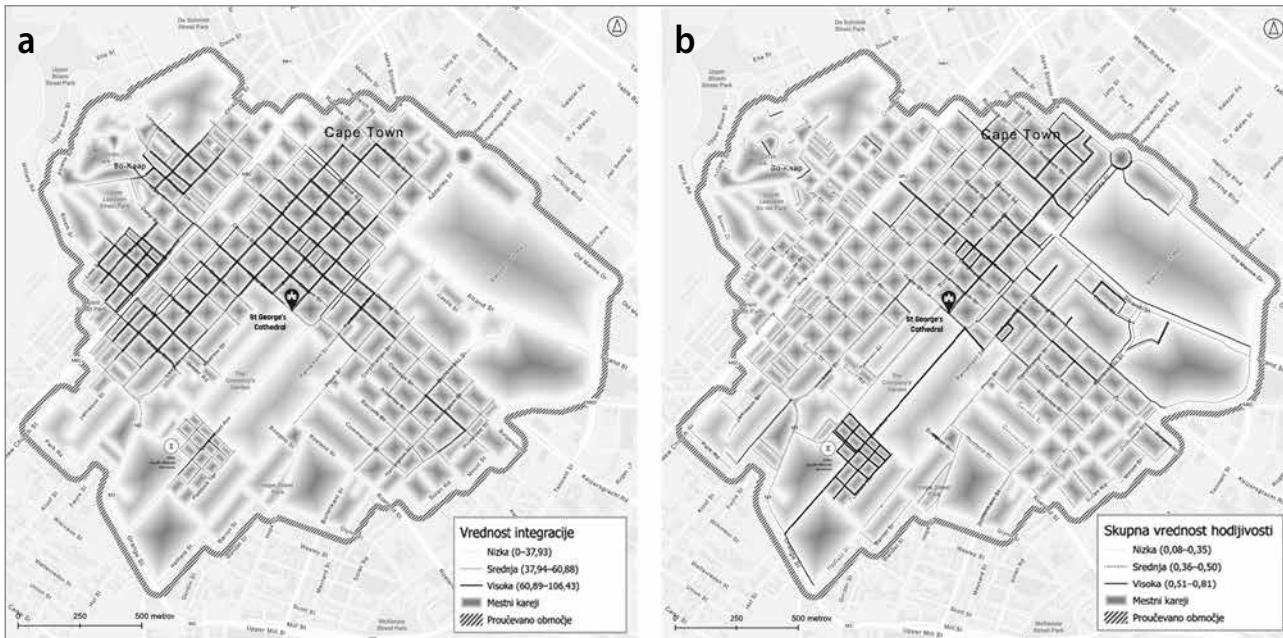
Slika 5: a) Karta prostorske integracije (povezanosti) ulic, b) karta SOH (ilustracija: avtorja)
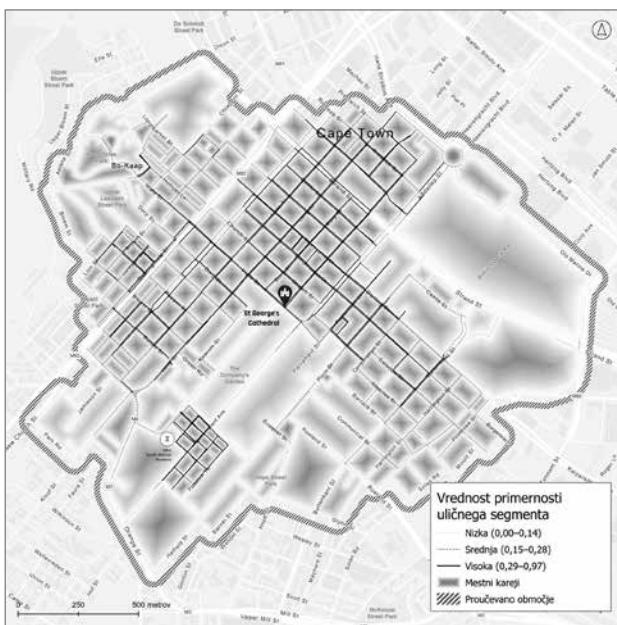

Slika 6: Karta PUS (ilustracija: avtorja)

tegorije glede na nujnost njihove prenove lahko načrtovalski organi v logičnem zaporedju izvedejo projekte mestne prenove, s katerimi lahko izboljšajo kakovost ulic. Če se pri tem osredotočijo na izboljšanje nekaterih spremenljivk na mikroravni, lahko povišajo vrednosti SOH in PUS ter posledično znižajo vrednost NUP, ne da bi za to porabili preveč časa ali sredstev. Manjši posegi, kot so na primer ureditve javnih klopi, ulične razsvetljave in vmesnih zelenih pasov med pločniki in cestiščem, zahtevajo malo časa in sredstev. S presojo ulične krajine lahko pridobimo podrobne podatke o slabo urejenih ali manjkajočih prvinah, ki vplivajo na hodljivost, na podlagi česar se lahko izvedejo ciljni posegi v grajenem okolju, ki izboljšajo

izkušnjo pešačenja. Izboljšanje značilnosti na mikroravni, ki so neposredno povezane s pešci, kot so pločniki, prehodi za pešce in ulična oprema, pozitivno vpliva na pešačenje v prostem času in telesno aktivnost ljudi (Steinmetz-Wood idr., 2020). Osredotočanje na ulične segmente, ki so najbolj potrebni izboljšav, lahko zato močno izboljša mobilnost pešcev v Cape Townu.

5 Sklep

Metodologija, ki jo avtorja predlagata v članku, ponuja nov pristop k razvrščanju in kartiranju posegov za izboljšanje ulične hodljivosti. Daje nov vpogled v hodljivost na mikroravni v središču Cape Towna, pri čemer združuje 19 prostorskih kazalnikov, ki se nanašajo na območja za pešce. Za mesta in države, v katerih ni razpoložljivih podatkov o ulicah ali pa se zbirajo samo občasno, je ključno, da začnejo reševati kompleksna vprašanja, povezana s trajnostnim razvojem, in oblikovati politiko, ki temelji na podatkih ter zagotavlja bolj zdrave in vključujoče sisteme mobilnosti. Za vsak segment ulice na proučevanem območju sta avtorja izračunala mero prostorske integracije (sprva sta za to nameravala uporabiti podatke OpenStreetMap, na koncu pa sta raje uporabila omrežje pločnikov in prehodov za pešce, ki sta ga sama digitalizirala, saj je bilo veliko podrobnejše in topološko primernejše), na podlagi česar sta kartirala najbolj središčna območja in določila ulice, na katerih so posegi za izboljšanje površin za pešce najbolj potrebni. V tem okviru lahko urbanisti in oblikovalci politike bolje razporedijo omejena naložbena sredstva in omogočijo izboljšave na področju mobilnosti pešcev. Metoda je uporabna tudi za lokalne strateške načrte in zelo primerna za stare soseske, ki ne morejo spremeniti svoje urbane zasnove ali težko ohranjajo
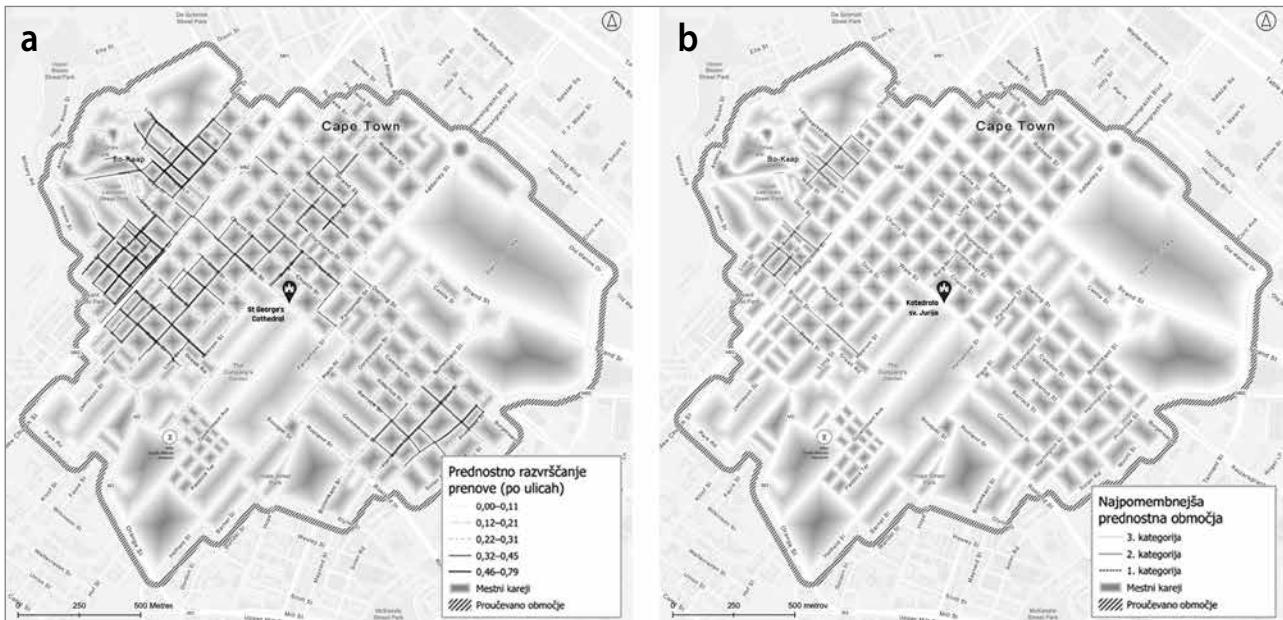
Slika 7: a) karta NUP, b) karta USTP (ilustracija: avtorja)

svojo lokalno identiteto, hkrati pa želijo pritegniti več pešcev. Uporabi se lahko na primer v starih mestih z obzidjem, kot sta španski Lugo ali Intramuros v Manili, in starih mestnih jedrih, kot je atenska Plaka.

Izsledki raziskave kažejo, da je večina ulic, v katerih je najbolj potrebna takojšnja prenova, v zahodnem delu središča Cape Towna, zlasti v predelu Bo-Kaap, kjer ni ustrezne infrastrukture za varno in udobno pešačenje. Izboljšave območij za pešce na ulicah te soseske bi omogočile večje število pešcev in njihovo zadovoljstvo ter splošno kakovost življenja v soseski. Morebitni programi prenove pa bi morali upoštevati tudi družbene pritiske na tem območju, zlasti vpliv rasnega ločevanja in gentrifikacije (Kotze, 2013). Poleg tega bi bilo treba pri projektih prenove ohraniti lokalne arhitekturne posebnosti, kot so hiše različnih barv, mošeje in tlakovane ulice. Če se posegi za izboljšanje površin za pešce skladajo z družbenogospodarskimi značilnostmi območja, je asimilacija lokalnih prebivalcev lažja (Forouhar in Forouhar, 2020). Tovrstna prizadevanja pomagajo izboljšati mestno okolje in ohraniti lokalno identiteto, v primeru Cape Towna kulturo malajskih muslimanov (Kotze, 2013). Na podlagi predlagane razvrstitve ulic glede na nujnost njihove prenove bi lahko zato odpravili neenakosti v središču Cape Towna in ustvarili več priložnosti za lokalne prebivalce ter s tem omogočili trajnosten razvoj mesta.

Izsledki predstavljene raziskave imajo tudi nekatere pomanjkljivosti. Ker je proučevanje na mikroravni temeljilo na uporabi posnetkov aplikacije Google Street View, je na rezultate vplival čas nastanka posnetkov, ki pa ni bil vedno enak. Za nekatere segmente ulic pa posnetkov sploh ni bilo na voljo, kar je vplivalo na zanesljivost proučevanja. Poleg tega je pri

Slika 8: a) Bryant Street, ulica 1. kategorije USTP, b) Buitengracht Street, ulica 2. kategorije USTP, c) Jordaan Street, ulica 3. kategorije USTP (vir: Google Street View)

izračunu prostorske integracije na rezultate na robu proučevanega območja vplival učinek roba, saj ulični odseki in prehodi za pešce zunaj proučevanega območja pri izračunu niso bili upoštevani. Pomembna omejitev raziskave je tudi ta, da avtorja proučevanja hodljivosti nista povezala s številom pešcev na posameznih območjih ali podatki o telesni aktivnosti. Prihodnje raziskave bi lahko navedene omejitve odpravile tako, da bi pri modeliranju hodljivosti upoštevale še več okoljskih in družbenih spremenljivk (npr. čistočo in varnost) ali pa analizirale večje in bolj heterogeno območje. Poleg tega bi lahko z anketo o tem, kako ljudje zaznavajo pešačenje, ugotovili, kako pomembne so prvine grajenega mestnega okolja pri mobilnosti pešcev ter katere bi bile zdravstvene in okoljske koristi pešcem prijaznejšega Cape Towna.

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Opombi

[1] Dostopno na: https://figshare.com/s/838b7c93fb6f187b0880.

[2] Dostopno na: https://figshare.com/s/37780a5dbdc821dda717.

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Igor BIZJAK

Dostopnost objektov za funkcionalno ovirane osebe: metoda za popis z uporabo spletnih orodij

Stanje v Sloveniji glede dostopnosti javnih objektov funkcionalno oviranim osebam je skrb vzbujajoče. Največkrat so ovire že pri dostopu do objekta (ni parkirnega prostora za invalide, do vhoda v objekt vodijo stopnice, pred vhodom je visok prag, vrata v objekt so pretežka, kljuka je nameščena previsoko ipd.) in v notranjosti objekta (stopnišča, neprilagojena dvigala, premajhne sanitarije ipd.). Da bi funkcionalno oviranim osebam omogočili prikaz morebitnih ovir ter te ovire prikazali lastnikom in vzdrževalcem objektov, je bila izdelana metoda za popis dostopnosti objektov za funkcionalno ovirane osebe z uporabo spletnih orodij, ki je predstavljena v tem članku. Metoda za popis dostopnosti objektov se opira na upoštevno zakonodajo in standarde s področja univerzalne dostopnosti. Pomembna je predvsem za natančno in primerljivo presojo morebitnih ovir in njihovih že vzpostavljenih prilagoditev. To je tako večfunkcijski okvir za presojo dostopnosti vseh objektov, saj omogoča pregled in prikaz morebitnih ovir za lastnike in vzdrževalce objektov, kot vodnik o dostopnosti objekta za funkcionalne osebe. V članku je predstavljena še implementacija metode v spletni sistem za popis dostopnosti objektov. Ta med drugim omogoča spremljanje dostopnosti objektov za potrebe funkcionalno oviranih oseb in pregled ugotovljenih ovir za lastnike in vzdrževalce objektov.

Ključne besede: metoda za popis dostopnosti, funkcionalno ovirane osebe, sistem spremljanja dostopnosti, notranja dostopnost objektov, spletna aplikacija

1 Uvod

V 26. členu Listine Evropske unije o temeljnih pravicah (2012: 397) »Unija priznava in spoštuje pravico invalidov do ukrepov za zagotavljanje njihove samostojnosti, socialne in poklicne vključenosti ter sodelovanja v življenju skupnosti«. V evropskem akcijskem načrtu za obdobje 2006-2007 o položaju invalidov v Evropski uniji (Komisija Evropskih skupnosti, 2005) je v tretjem operativnem cilju predvideno izboljšanje dostopnosti za vse, ki se povezuje z načelom oblikovanje za vse. Po tem načelu se zagovarja oblikovanje raznih pripomočkov in okolja na tak način, da lahko pripomočke in dostop do grajenega brez večjih ovir uporabljajo vsi ljudje, brez potreb po posebnem oblikovanju in adaptaciji grajenega okolja (Hanson, 2005). Pravica do dostopnosti grajenega okolja, informacij in komunikacij se v Evropski uniji obravnava z dveh vidikov. Prvi vidik se nanaša na pravico invalidov do socialne vključenosti in zagotavljanja enakih možnosti, drugi vidik pa zadeva standardizacijo na področju prostorske zakonodaje.

Na spletnem mestu Evropske agencije za temeljne pravice je bilo leta 2014 objavljeno poročilo o obveznih standardih za dostopnost javnih objektov po evropskih državah. Poročilo izhaja iz evropske strategije o invalidnosti in v njem je navedeno, da jim za Slovenijo ni uspelo pridobiti podatkov o sprejetih standardih na tem področju. Slovenija je sprejela standard ISO 21542:2011 – Gradnja stavb – Dostopnost in uporabnost grajenega okolja leta 2011, a je bil v tistem času pripravljen le v angleškem jeziku. V slovenščino je bil preveden leta 2012, s popravkom leta 2017.

V Sloveniji temeljne pravice za izenačevanje možnosti izhajajo iz 14. člena Ustave RS (Ur. l. RS, št. 33/91-I), v katerem je zapisano, da so v Sloveniji »(…) vsakomur zagotovljene enake človekove pravice in temeljne svoboščine, ne glede na narodnost, raso, spol, jezik, vero, politično ali drugo prepričanje, gmotno stanje, rojstvo, izobrazbo, družbeni položaj, invalidnost ali katerokoli drugo osebno okoliščino«. Področje enakih možnosti in nediskriminacije invalidov urejajo tudi Konvencija o pravicah invalidov, Zakon o izenačevanju možnosti invalidov in Zakon o socialnem vključevanju invalidov.

Dostopnosti brez ovir se zagotavlja za vse funkcionalno ovirane osebe. V 3. členu Pravilnika o univerzalni graditvi in uporabi objektov (Ur. l. RS, št. 41/2018) so »funkcionalno ovirane osebe (…) invalidi in druge osebe s trajnimi ali začasnimi okvarami (npr. gibalne oviranosti, okvare vida, okvare sluha, poškodbe, kronične bolezni), motnjami (npr. motnje v duševnem razvoju) oziroma telesnimi značilnostmi, ki so lahko tudi posledica različnih življenjskih situacij (npr. starejši, otroci, nosečnice)«. V standardu SIST ISO 21542:2011 (ter njegovih različicah ISO 21542:2012 in ISO 21542:2022) so navedene še osebe s prikritimi omejitvami (npr. s težavami z vzdržljivostjo in alergijami) in osebe različnih starosti in rasti (vključno s slabotnimi osebami). Dodana je še opomba, da to velja za osebe z začasno oviranostjo. Poleg tega je opredeljen izraz za dostopnost (do stavb in delov stavb), to je »urejenost stavb ali delov stavb, da lahko ljudje ne glede na invalidnost, starost ali spol do njih dostopajo, vstopajo vanje, izstopajo iz njih in jih uporabljajo. Dostopnost vključuje preprost neodvisen dostop, vstop, evakuacijo in/ali uporabo stavbe ter njene opreme in objektov za vse potencialne uporabnike, pri čemer so zagotovljeni zdravje, varnost in dobro počutje posameznikov pri teh aktivnostih«. V Gradbenem zakonu (GZ) univerzalna graditev in uporaba objektov vključujeta graditev oziroma uporabo objektov, dostopnih vsem ljudem, ne glede na njihovo morebitno trajno ali začasno oviranost (GZ, Ur. l. RS, št. 61/2017).

V članku so za ugotavljanje dostopnosti obravnavane funkcionalno ovirane osebe, ki jih opredeljujemo tudi kot osebe z oviranostmi, osebe z invalidnostjo, invalidi ali ranljive skupine. Zaradi specifičnosti potreb so posebej obravnavani trije splošno priznani tipi invalidnosti: slepota in slabovidnost, gibalna oviranost, gluhost in naglušnost.

Ko govorimo o gibanju funkcionalno oviranih oseb, moramo razlikovati gibanje v domačem okolju, gibanje v zunanjem okolju domačega kraja in širše ter gibanje v grajenem okolju (v stavbah). Izboljšati mobilnost in navigacijo za posamezno skupino invalidov pomeni najprej analizirati stanje v prostoru (Keerthirathna idr., 2010; Welage in Liu, 2011; Andrade in Ely, 2012; Calder in Mulligan, 2014; Basha, 2015; Gilart-Iglesias idr., 2015; Wolniak, 2016; Stauskis, 2018; Aini idr., 2019; Slaug idr., 2019; Rebernik idr., 2020; Carlsson idr., 2022) in pripraviti nove tehnološke sisteme in rešitve (zbiranje podatkov, izdelava spletne platforme, izdelava navodil ipd.).

Grajeno okolje moramo prilagajati in načrtovati v korist funkcionalno oviranih ljudi (Vovk, 2000; Hanson, 2005), pri tem pa ne smemo pozabiti tudi na dostopnost do objektov oziroma varno multimodalno mobilnost oseb v urbanem okolju (Mobasheri idr., 2017; Szaszák in Kecskés, 2020). V življenju invalidov in oseb z različnimi oviranostmi so pripomočki za mobilnost pomemben del, brez katerega si danes ni mogoče zamišljati samostojnega in varnega življenja ter dela. Nove rešitve temeljijo na razvoju novih metod in uporabi novih tehnologij (IKT in druge). S pripomočki želimo zapolniti vrzel na področju posamezne invalidnosti (npr. senzorne ali fizične oviranosti).

Pametna mesta vključujejo vse svoje prebivalce in razvijajo pametno mobilnost tudi za osebe z oviranostmi, npr. navigacijo

pešcev v mestu (Mora idr., 2016, 2017; Wheeler idr., 2020), mestni prevoz (prilagojeni mestni avtobusi), varne koridorje brez ovir, npr. za gibalno ovirane osebe, navigacijski sistem za slepe in slabovidne (Virtanen in Koskinen, 2004; Oliveira Neto, 2019; Telles idr., 2021) ali rešitev, ki omogoča predlaganje izboljšav v prostoru (Wang idr., 2021). Rešitve vključujejo združevanje številnih strokovnih področij: baze podatkov za navigacijo, geografske informacijske sisteme (GIS), IKT, uporabniško izkušnjo interneta stvari, uporabo pametnih telefonov in navigacijskih platform (Cohen in de Duarte, 2016; Rashid idr., 2017; Rebernik idr., 2017; Borowczyk, 2018).

Naslednji izziv za razvijalce programske opreme in znanstvenike je načrtovanje celostne in vključujoče dostopnosti za funkcionalno ovirane osebe – tako zunanje dostopnosti do objektov kot dostopnosti znotraj objektov, ki je podprta z novimi tehnologijami. Na temo metodologije preverjanja dostopnosti javnih objektov brez ovir za vse vrste invalidnosti je bilo napisanih kar nekaj člankov in monografij (Vovk, 2000; Sendi in Kerbler, 2009, 2013; Žolgar idr., 2010; Rener idr., 2011, 2012; Vodeb in Bračun Sova, 2011; Kerbler, 2012; Sendi idr., 2012; Sendi, 2014; Biere Arenas idr., 2016). Predstavljene metode za presojo dostopnosti najpogosteje opisujejo presojo dostopnosti za zunanjo dostopnost, nekaj teh metod pri presoji uporablja tudi orodja informacijske tehnologije. Malo teh metod omenja presojo notranje dostopnosti. Metode ne izhajajo iz vprašanja, kako opredeliti, ali je ovira za funkcionalno ovirane osebe premagljiva in ali je rešitev dejansko v skladu s standardi za univerzalno dostopnost ali ne. Standardizirano presojo dostopnosti in s tem primerljivost med proučenimi objekti omogočajo izključno področna zakonodaja (GZ in Pravilnik o univerzalni graditvi in uporabi objektov) in standardi (SIST ISO 21542:2011 ter njegovi različici ISO 21542:2012 in ISO 21542:2022). Zato je bila v nadaljevanju izvedena raziskava, ki je omogočila izdelavo metode, temelječe na upoštevnih standardih, zakonu in Pravilniku o univerzalni graditvi. Metoda je v nadaljevanju na podlagi spletnih orodij in spletnih tehnologij omogočila izdelavo sistema za presojo in prikaz dostopnosti objektov za funkcionalno ovirane osebe.

2 Opis metode za popis dostopnosti

Priprava metode je potekala v štirih korakih:
- prvi korak je zajel pregled spletno dostopnih virov s področja zunanje in notranje dostopnosti grajenega prostora. Pri pregledu smo iskali možne rešitve za elektronski zajem podatkov o zunanji in notranji dostopnosti objektov, in to kar na terenu, za funkcionalno ovirane osebe, za organizacijo zajetih podatkov, za možnosti odprtega dostopa do teh podatkov ter za možnosti dostopa do njih za raznovrstne uporabnike (za funkcionalno ovirane osebe,

ki iščejo podatke o dostopnosti, za vzdrževalce objektov in lastnike, ki bi podatke uporabili za odpravljanje ovir, ter za popisovalce dostopnosti objektov);
- v drugem koraku je bila izdelana metoda za popis dostopnosti objektov za funkcionalno ovirane osebe, pri čemer se ta popis izvaja z uporabo digitalnih orodij (Bizjak, 2014; Bizjak idr., 2017);
- v tretjem koraku je bil na podlagi navedene metode izdelan osnovni del sistema za spletni popis dostopnosti objektov in spremljanje dostopnosti objektov za funkcionalno ovirane osebe;
- v četrtem koraku se je metoda preizkusila na terenu, in sicer z uporabo spletnega sistema za popis dostopnosti objektov.

2.1 Prvi korak: pregled literature s področja zunanje in notranje dostopnosti grajenega prostora

Pregled literature je zajel iskanje po ključnih besedah, kot so dostopnost, invalidi, funkcionalno ovirane osebe, parkirišča za invalide, interaktivni zemljevid dostopnosti, mobilna aplikacija za dostopnost, dostopno z invalidskim vozičkom ipd. Rezultati iskanja so dali vpogled v metode, ki so bile opisane v raziskovalnih in drugih člankih in so predstavljene v nadaljevanju.

Primer iz Brazilije (Cohen in de Duarte, 2016) opisuje uporabo programa za pametne telefone Guida de acessibilidade, s katerim si lahko funkcionalno ovirane osebe, starejši in drugi ogledajo znamenitosti v brazilskih mestih. Vodič jim nudi informacije o dostopnosti znamenitosti, kot so parkirišča za invalide in dostopne poti od parkirišča do znamenitosti z opisom ovir skladno z brazilskimi tehničnimi standardi. Pri tem se uporabljena metoda za popis dostopnosti opira na tehnične standarde dostopnosti in na njihovi podlagi se podatki prikazujejo uporabniku.

Naslednji primer za pametni telefon je aplikacija, ki slepim in slabovidnim omogoča lažje prečkanje semaforiziranih križišč (Liao, 2013). Aplikacija uporablja senzorje, ki so v pametnem telefonu (npr. GPS), in napravo, vgrajeno v semafor, ki brezžično sporoča stanje semaforja (katera signalna luč je prižgana in kako dolgo neka luč sveti). Na podlagi obeh tehnologij lahko slepa ali slabovidna oseba, ki se ustavi pred pametnim križiščem, z uporabo pametnega telefona izve, katera luč trenutno sveti na semaforju in kako dolgo bo ta luč še svetila. Ker sistem uporablja senzorje v pametnem telefonu, ki zaznajo tudi smer premikanja uporabnika, aplikacija na semaforiziranem križišču več cest zazna smer premikanja uporabnika in temu primerno uporabniku sporoči stanje ustreznega semaforja za varno prečkanje križišča. V tem primeru metoda uporablja zunanje

senzorje in senzorje pametnega telefona za zbiranje podatkov, te nato analizira v telefonski aplikaciji in jih v obliki glasovnega sporočila posreduje slepemu uporabniku.

Vožnja z invalidskim vozičkom po mestnih ulicah in prečkanje križišč sta lahko velika težava, če v križiščih robniki niso spuščeni, ni dvignjenih prehodov za pešce, če so pločniki preozki ali so na njih ovire ipd. Pri tem lahko pomagajo razni interaktivni zemljevidi, kot je na primer spletna stran Dostopnost prostora (Internet 1), ki na podlagi interaktivnega spletnega sistema GIS omogoča iskanje in prikazovanje dostopnih poti za gibalno ovirane ter slepe in slabovidne, npr. do javnih stranišč, parkirnih mest za gibalno ovirane, postajališč javnega prometa, prehodov za pešce in drugih javnih objektov. Pri tem so na zemljevidu prikazane tudi fizične ovire, kot so stopnice, neustrezen naklon klančin in neustrezne poglobitve robnikov na cestišču. Podoben pregledovalnik uporablja tudi System of Accessible Itineraries, narejen za Porto na Portugalskem (Lopes in Alves, 2021). Uporabniki lahko interaktivni zemljevid dostopnosti javnih in drugih objektov pomagajo celo soustvarjati. Tak primer je aplikacija Wheelmap (https://Wheelmap.org/), interaktivni zemljevid na pametnem telefonu, ki uporabnikom omogoča, da sami v aplikaciji sporočajo dostopnost do izbranega objekta (Mobasheri idr., 2017). Izhodišče za zemljevid je odprtokodna platforma OpenStreetMap, ki uporabnikom omogoča, da lahko zemljevide samo dopolnjujejo. Aplikacija Wheelmap je sestavljena iz dveh delov, v enem delu lahko uporabniki podatke o dostopnosti pregledujejo in vnašajo nove podatke o dostopnosti, drugi del pa je namenjen razvijalcem aplikacije za preizkušanje njenih novih funkcij. Aplikacija ima tudi programski vmesnik, ki deluje po načelu RESTful in omogoča, da se lahko do podatkov interaktivnega zemljevida dostopa tudi iz drugih aplikacij. Programski vmesnik ima tudi spletni portal Dostopnost prostora (Internet 1), kjer je mogoče podatke urejati in do njih dostopati; te podatke je mogoče uporabiti tudi v drugih spletnih aplikacijah (Rener idr., 2019).

Podatki za izdelavo interaktivnih zemljevidov se zajamejo bodisi tako, da pripravljavci zemljevidov na terenu pregledajo dostopnost poti, bodisi tako, da to storijo s pregledovanjem satelitskih posnetkov in uporabo orodja Google Street View. Pogosto se za popis ovir v odprtem prostoru uporabljajo podatki, ki jih v okviru soustvarjanja prispevajo uporabniki aplikacije. Ti svoje védenje o prostoru in njegovih ovirah vnesejo v bazo podatkov aplikacije in tako delijo podatke o stanju v prostoru z drugimi uporabniki aplikacije.

Dodajanje lokacij in podatkov o dostopnosti je možno tudi na spletni strani pridem.si (Internet 2), ki omogoča preprost vnos podatkov o dostopnosti objekta z uporabo simbolov (piktogramov). Simboli prikazujejo raznovrstne elemente dostopnosti, kot je na primer simbol za stranišča, ki ima širino vrat najmanj

80 cm, pomožne ročke ob straniščni školjki in zadosten prostor za obračanje invalidskega vozička ali pa simbol za dostopno navadno stranišče. Na spletni strani je tudi razlaga simbolov, da se uporabnik, ki želi vnesti dostopnost za želeno lokacijo, lažje odloči, kateri simbol bolj verodostojno opiše dostopnost.

Tudi v tem primeru je bila za metodo zajema podatkov o dostopnosti objekta izbrana metoda soustvarjanja. Pri tem je bil uporabljen nabor simbolov, ki jih je standardiziral izdelovalec aplikacije in opisujejo tip ovire. Uporabnik, ki želi popisati dostopnost objekta, to stori s simboli, ki jih izbere v programu. Izdelovalec je s tem dosegel, da so vsi objekti enotno popisani. Standardizirani simboli ne sledijo standardom s področja grajenega okolja. Podobna aplikacija istih avtorjev za pametne telefone, ki omogoča pregled dostopnosti objektov za gibalno ovirane, je tudi Ljubljana by Wheelchair (Internet 3), ki pa ne omogoča soustvarjanja ali dodajanja opisov dostopnosti za druge uporabnike mobilne aplikacije.

Standardi s področja dostopnosti grajenega okolja omogočajo okvir, ki se lahko uporabi pri preverjanju, ali je grajeno okolje dostopno ali ne. Spletne strani, ki ponujajo podatke o dostopnosti objektov za funkcionalno ovirane osebe, se zanašajo na praktične izkušnje funkcionalno oviranih oseb, ki vnašajo podatke o dostopnosti (Internet 2; Internet 3; Internet 4; 4Internet 5). To pogosto pomeni, da nekateri objekti niso dostopni za vse. Lep primer za to trditev je, da je objekt dostopen, če ima klančino, čeprav je ta strmejša, kot bi lahko bila po veljavnem standardu, in fizično šibkejše osebe ne morejo dostopati po klančini do objekta brez pomoči spremljevalca. Za preverjanje dostopnosti bi morali zato pri presoji upoštevati veljavne standarde. Testna metodologija za analiziranje in presojo dostopnosti javnih objektov za funkcionalno ovirane osebe z vprašalnikom, ki je bil narejen na podlagi pregleda gradbene zakonodaje, je bila razvita v raziskovalnem projektu, pri katerem sta sodelovala oddelek za urbanistično oblikovanje Tehnične univerze kneza Gediminasa v Vilni in raziskovalni inštitut SOTERA Tehnične univerze v Helsinkih (Stauskis, 2005).

Metodologija uporablja vprašalnik, sestavljen na podlagi zakonodaje, ki ureja splošno dostopnost v Litvi in okoliških državah, vprašanja pa so se nanašala le na zunanjo dostopnost objektov, torej poti do objekta, ki vključujejo površine za pešce, prehode za pešce čez cestišče ter površine za parkiranje (npr. Ali je dovolj parkirnih mest za invalide?, Ali je pločnik širok vsaj 1.200 mm?). Na vsako vprašanje je bilo možnih več odgovorov (da – dostopno, ne – ni dostopno in ni takega elementa – na opazovanem mestu ni bilo elementa, na katerega se je nanašalo vprašanje). Testna vprašanja so preverjale funkcionalno ovirane osebe (fizično močnejša in fizično slabotnejša oseba na invalidskem vozičku, oseba z berglami, slepa

oseba itd.). Pri tem je pomembno poudariti, da so pri testiranju uporabili osebe, ki so bile fizično različno sposobne. Kar je za odraslo fizično močno osebo na vozičku dostopno, ni nujno tudi za starejšo fizično slabše sposobno osebo ali otroka na vozičku. Poleg tega je treba upoštevati slepe in slabovidne ter gluhe in naglušne osebe. Zadnje se lažje premikajo po prostoru, a se srečujejo z oviranostjo na področju avdiokomunikacij in sposobnosti razumevanja kompleksnih besedil.

Javni objekti so lahko med seboj zelo različni tako po arhitekturi kot po vsebinah, ki jih zagotavljajo. Zato mora metoda za popis objektov upoštevati standarde s področja univerzalne gradnje, biti mora fleksibilna pri upoštevanju vsebin objektov in omogočati mora uporabo elektronskih naprav (tablice, pametni telefoni, prenosni računalniki ipd.) in njihovih senzorjev (GPS, fotoaparat, povezava v mobilno omrežje itd.).

Pregled literature in spletišč s področja je pokazal, da le malo metod za zajem podatkov o dostopnosti objektov uporablja spletna orodja. Največkrat gre za zajem podatkov z uporabo spletnih interaktivnih zemljevidov in z metodami soustvarjanja. Nekaj metod je podprtih s standardi o univerzalni gradnji oziroma s standardi s področja dostopnosti grajenega okolja. Navedeni primeri, ki se nanašajo na zunanjo dostopnost, obravnavajo pešceve površine in nivojske prehode na cestišču (kolikšna je širina pločnikov, ali so na pločnikih prehodi za pešce poglobljeni, ali so parkirišča za invalide ustrezno velika ipd.). Še manj je primerov, ki se nanašajo na notranjo dostopnost, ki obravnava vstop v objekt (stopnice, klančina, prag) in notranji dostop do stranišč, dvigal, sob za nastanitev ipd. Pri tem nekateri primeri kot metodo za opis dostopnosti omenjajo uporabo standardov pri izvedbi popisa, a brez opisa uporabe elektronskih naprav in spletnih orodij pri popisu.

2.2 Drugi korak: metoda za popis dostopnosti objektov za funkcionalno ovirane osebe z uporabo digitalnih orodij 2.0

Izhodišče za zajem in spremljanje podatkov o zunanji in notranji dostopnosti objektov za funkcionalno ovirane osebe so bili upoštevna zakonodaja s področja univerzalne dostopnosti (GZ in Pravilnik o univerzalni graditvi in uporabi objektov) in upoštevni standardi (ISO 21542:2011, SIST 1186:2016, SIST 4190-5:2012 in SIST 60118-4:2015). Iz zakonodaje in standardov so bila izluščena vprašanja, s katerimi je mogoče opisati oviro in ugotoviti, ali je ta premagljiva. Vsakemu vprašanju je dodan tudi vir (zakon, standard ipd.), na podlagi katerega je bilo vprašanje oblikovano. Na primer:

- Ali je pred in za pultom dovolj velik manevrski prostor (1500 x 1500 mm, priporočeno 1800 x 1800 mm)?, saj mora biti pred in za informacijskim pultom dovolj velik manevrski prostor, da se oseba na vozičku lahko obrne;
- Ali je pult opremljen s sistemom za izboljšanje sluha (z vgrajeno slušno indukcijsko zanko)?, saj je za naglušno osebo to informacija, ali je za to vrsto funkcionalne oviranosti omogočena možnost, da se oseba lahko normalno pogovori z osebo na drugi strani pulta.

Izbrani nabor vprašanj je zagotovil zadostno bazo podatkov, na podlagi katerih so se v naslednjem koraku tvorili sklopi vprašanj, ki opisujejo posamezne elemente (zunanji dostop do vhodnih vrat, vhodna vrata, avla, informacijski pult, stopnišče, dvigalo, stranišča, sobe itd.), za katere se mora izvesti presoja, ali so dostopni ali ne. Primer vhodnih vrat pokaže, da je za presojo njihove dostopnosti na voljo več kot 30 vprašanj za vse vrste funkcionalne dostopnosti. Vprašanja se lahko nanašajo na velikost in širino vrat, vrsto vrat (avtomatska, drsna, krilna ...), višino namestitve in obliko kljuke, ali so vrata steklena, kakšen prag je pred vrati ipd.

Podatki o objektih so v podatkovni bazi povezani z elektronskim popisnim listom, zato je treba pred začetkom popisa v bazo podatkov vnesti podatke o objektu (naslov objekta, sliko pročelja, prostorske koordinate, šifro katastrske občine in šifro objekta iz katastra stavb ipd.). Med popisom se v popisni list vnašajo vnaprej pripravljeni sklopi vprašanj za posamezni ocenjevani element objekta. Vprašanja, ki se vnesejo v popisni list, niso povezana s tabelo vprašanj, kar omogoča, da se lahko s popisnega lista črtajo odvečna vprašanja (v prej omenjenem primeru vhodnih vrat je lahko več vprašanj, ki se nanašajo na različne vrste vrat, ta vprašanja je možno izbrisati, ko se ve, kakšna vhodna vrata vodijo v objekt). Nepovezanost popisnega lista s tabelo vprašanj omogoča tudi, da vprašanja na popisnem listu ostanejo nespremenjena, čeprav se vprašanja v tabeli vprašanj spremenijo na primer zaradi spremenjene zakonodaje ali standardov. Tako se ohrani časovna sledljivost virov, iz katerih so bila črpana vprašanja o dostopnosti proučevanega elementa. Na podlagi opisane metode (slika 1) je bil v nadaljevanju izdelan spletni sistem za zajem in spremljanje podatkov o dostopnosti objektov za funkcionalno ovirane osebe.

2.3 Tretji korak: izdelava spletnega sistema za zajem in spremljanje podatkov

Uvedba metode v prakso je omogočila izdelavo spletnega sistema za zajem in spremljanje podatkov o zunanji in notranji dostopnosti proučevanih objektov (Internet 4). Ker je sistem namenjen tudi drugim deležnikom v postopkih presoje, kot so naročniki, vzdrževalci in uporabniki, ki jih zanima, ali je objekt dostopen in kako je dostopen, vsebuje več funkcij kot samo zajem podatkov.
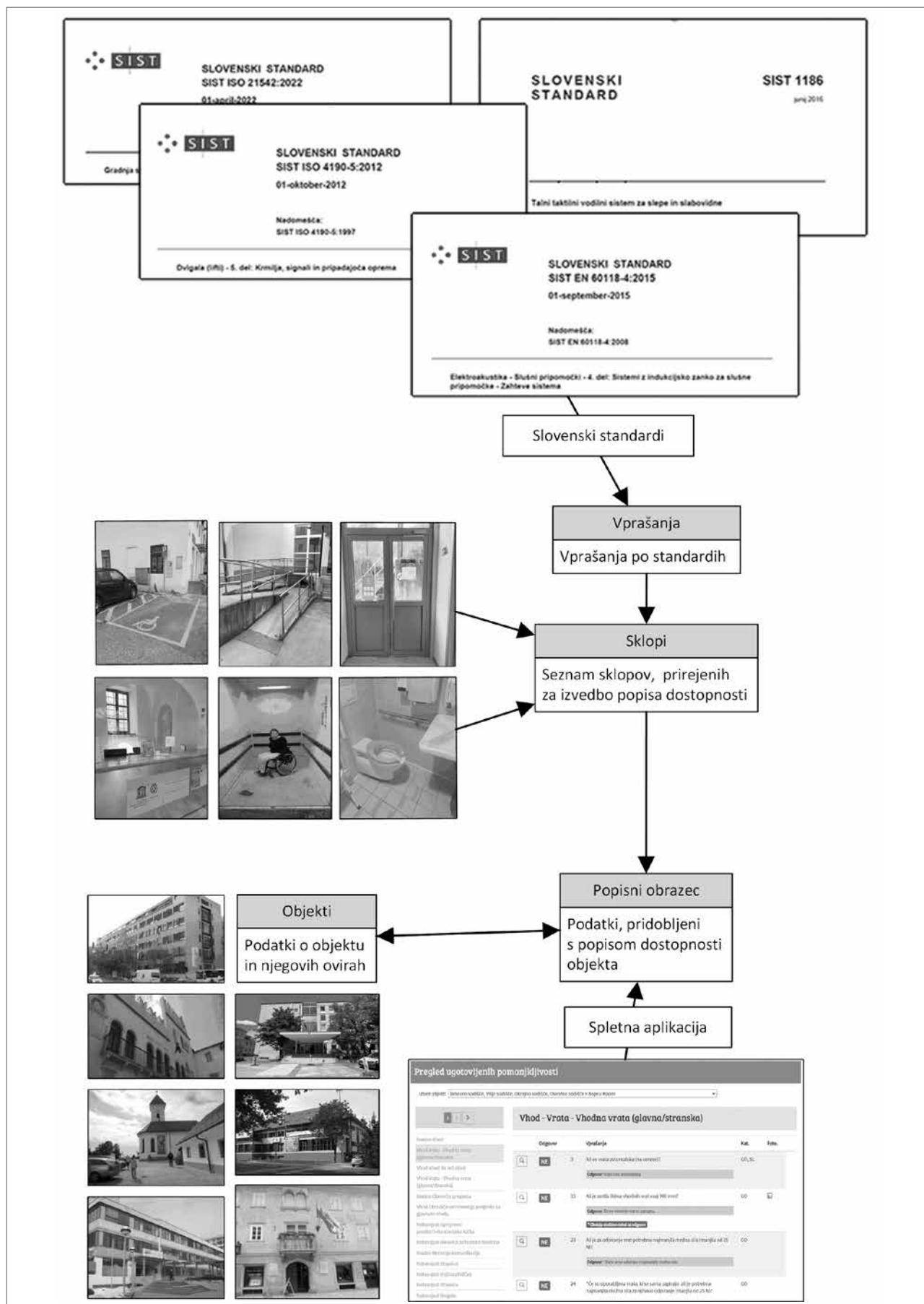
Slika 1: Shema metode popisa dostopnosti (ilustracija: avtor)
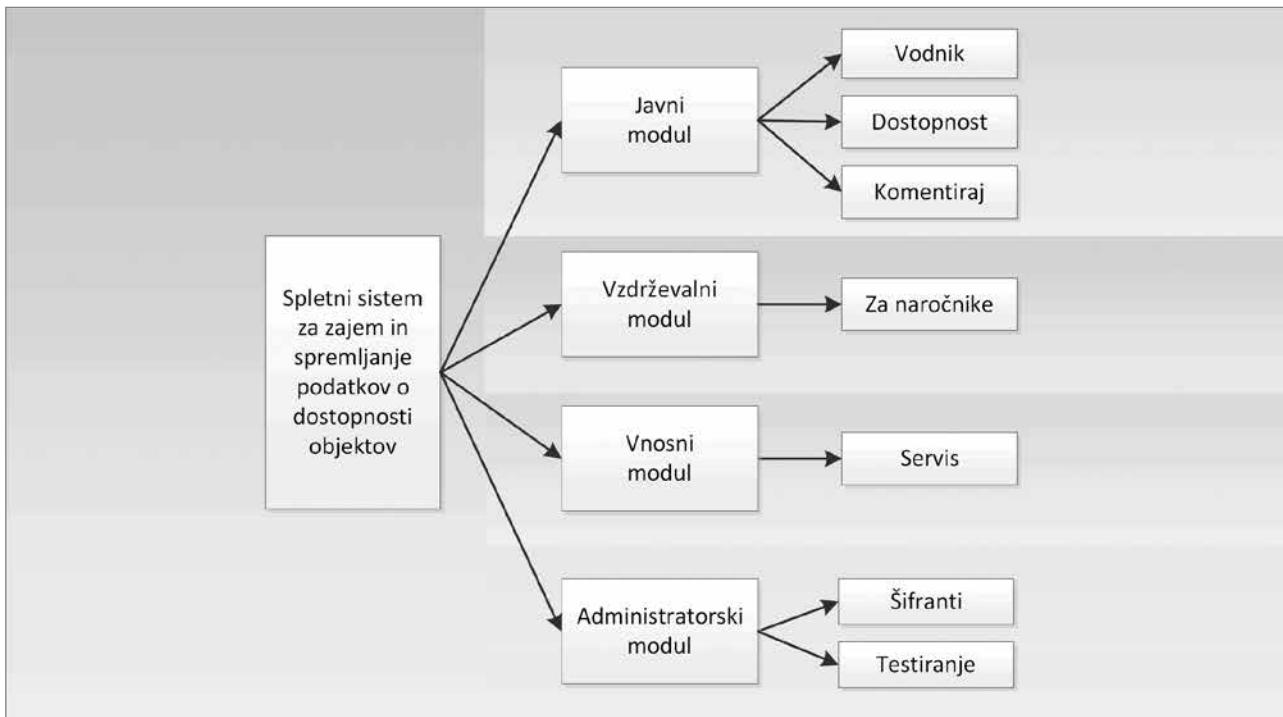
Slika 2: Model sistema (ilustracija: avtor)

Sistem je sestavljen iz štirih med seboj povezanih modulov (slika 2). Javni modul je namenjen uporabnikom, ki želijo preveriti dostopnost pregledanih objektov. Vzdrževalni modul je namenjen vzdrževalcem in lastnikom pregledanih objektov, za katere so bili podatki vneseni v bazo podatkov. Vnosni modul, ki je namenjen pregledovalcem objektov na terenu, ki lahko s pametnim telefonom ali tablico vnesejo podatke o pregledovanem objektu neposredno v bazo podatkov prek spletne povezave, je izdelan na podlagi metode za popis dostopnosti objektov za funkcionalno ovirane osebe z uporabo spletnih orodij. Administratorski modul pa je namenjen vzdrževalcem sistema za preverjanje delovanja in dodajanja novih funkcionalnosti sistema.

V nadaljevanju je predstavljen le vnosni modul, ki je bil izdelan na podlagi metode za popis dostopnosti objektov za funkcionalno ovirane osebe. Izhodišče za izdelavo vnosnega modula in nato celotnega sistema je arhitektura tipa odjemalec-strežnik (slika 3). Jedro delujočega sistema je DNN CMS (Sellers in Walker, 2009; Washington in Lackey, 2010), ki deluje v okolju MS IIS (ang. Microsoft Internet Information Server). CMS je modularni odprtokodni sistem, ki omogoča dodajanje programabilnih modulov in s tem nove funkcionalnosti. Moduli temeljijo na tehnologiji Microsoft.NET, vsi pa uporabljajo relacijsko bazo podatkov MS SQL (Donahoo in Speegle, 2005; Mistry in Misner, 2014). Relacijska baza podatkov omogoča shranjevanje poljubnih podatkovnih tipov. Ti so združeni v med seboj povezanih tabelah. Zaradi optimizacije baze podat-

kov so nekateri ponavljajoči se podatki shranjeni v seznamih. CMS vključuje tudi modul za izdelavo lastnega socialnega omrežja.

Pri izdelavi sistema so bili uporabljeni programabilni modul (XMOD Pro) za izdelavo vnosa podatkov v podatkovno bazo in izpisa podatkov o dostopnosti objektov iz podatkovne baze (Ryan, 2020), modul API REST za programsko izmenjavo podatkov med spletnimi portali ali servisi (Vojnović, 2019; Hussein, 2021; Liu idr., 2022; Martin-Lopez idr., 2022) ter skript modul Razor za programiranje dodatnih funkcionalnosti sistema (Brind in Spaanjaars, 2011; Chadwick, 2011; Microsoft, 2011). Uporabljeni so bili tudi moduli za izdelavo spletnega foruma in HTML-modul za izdelavo opisnih spletnih strani na portalu.

Podatki, ki se zajemajo med popisom, in drugi podatki, ki so pomembni za delovanje sistema, so v relacijski bazi podatkov MS SQL. Sistem uporablja dve bazi podatkov. V prvi so podatki, ki jih sistem uporablja za svoje nemoteno delovanje, v drugi, ločeni bazi pa so podatki o objektih in njihovih ovirah. Ločena baza omogoča uporabo zunanjim uporabnikom prek vmesnika API in hkrati zaščiti glavno bazo, do katere zunanji uporabniki nimajo dostopa. V ločeni bazi so nekateri podatki shranjeni kot seznami (na sliki 4 označeni s predznakom OS_), pripravljeni so ob nastanku baze podatkov in se redko spreminjajo ali dopolnjujejo. Preostali podatki (na sliki 4 označeni s predznakom O_) pa so tisti, ki se popolnjujejo ob presoji objektov.
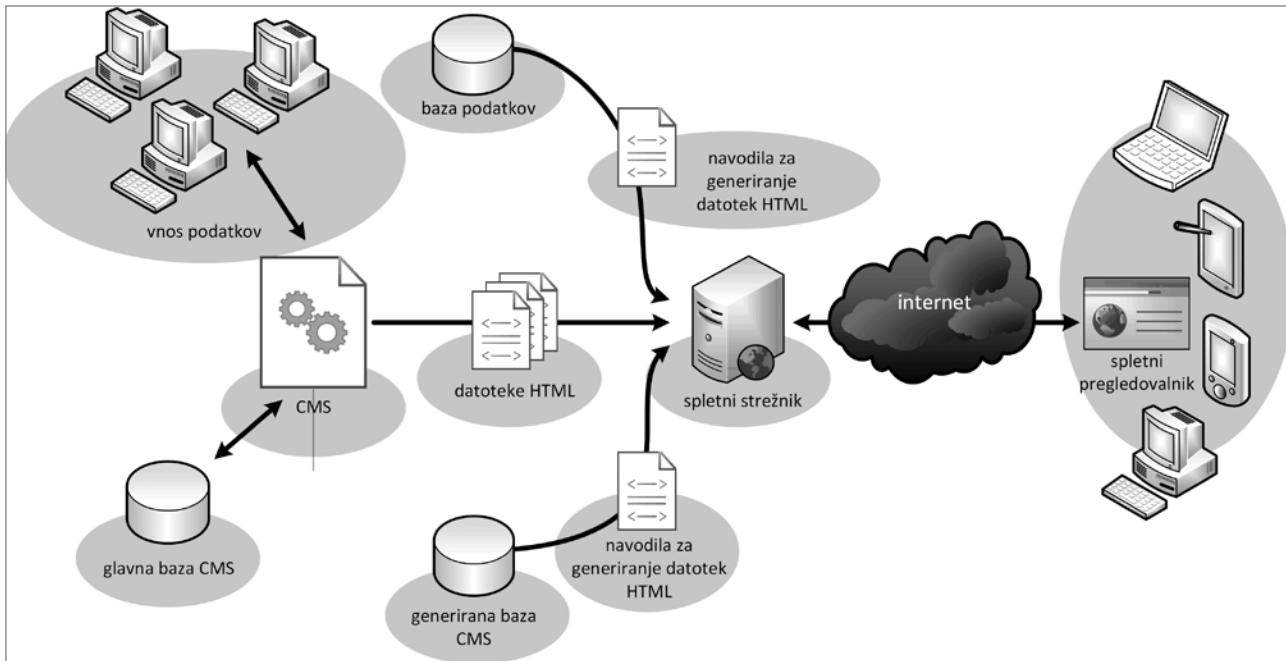
Slika 3: Arhitektura sistema CMS (ilustracija: avtor)
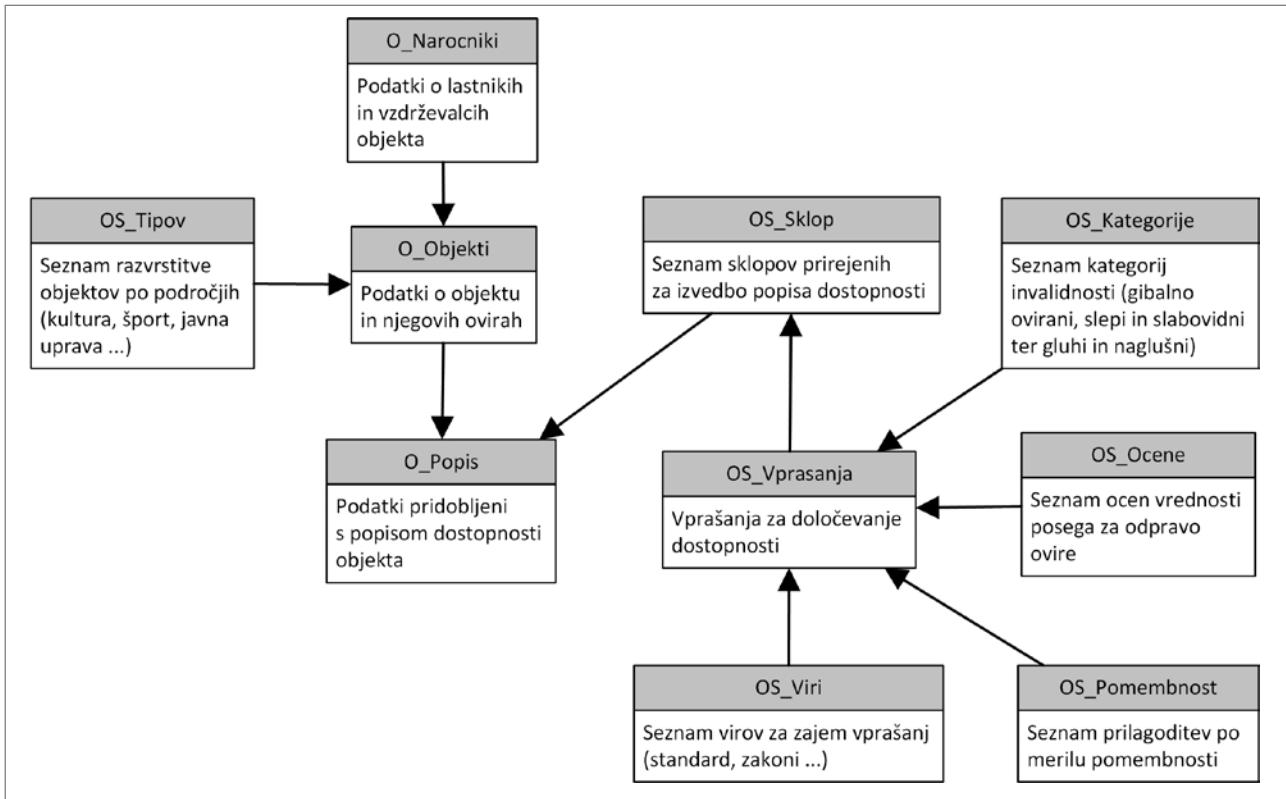
Slika 4: Organizacija tabel v bazi podatkov (ilustracija: avtor)

Na podlagi baze podatkov so bili izdelani vnosni in pregledni obrazci za vnos podatkov s programabilnim modulom XMOD Pro. Vsak vnosni obrazec omogoča vnos novega podatka, popravljanje že vnesenega podatka in brisanje tega (slika 5). Pregledni obrazci omogočajo pregled podatkov, ki so shranjeni v tabelah baze podatkov, razvrščanje teh in podroben pregled podatkov (slika 6). Ti obrazci omogočajo vnos podatkov o seznamih, objektih (slika 7) in naročnikih izvedbe popisov.

Vstavi nov objekt:

Ime objekta:	
Naslov:	
Kraj:	
Šifra katastrske občine:	1000-LEVEC (ŽALEC)
Identifikacijska številka stavbe:	
Identifikacijska številka dela stavbe (lahko jih je več, predeljenih z vejico):	
Tip objekta/področje:	Javni prostor
Naročnik:	Urbanistični inštitut RS
Slika (ime datoteke):	
Opis slike:	
Datum:	
X koordinata:	
Y koordinata:	
Ocena:	
Prikaz v iskalniku (0-NE, 1-DA):	
Prikaz zunanje dostopnosti (0-NE, 1-DA):	

Slika 5: Prikaz dela vnosnega obrazca za vnos podatkov o objektu (vir: zajem zaslona spletne aplikacije)

Seznam vprašanj

Show 25 entries   Search:

		ID	KATEGORIJA	Vprašanje	Vir	Pogoj	Ocena	Pomembnost	
✎	🔍	1	GO	Ali je zagotovljeno dovolj parkirnih mest za za gibalno ovirane osebe? (1 dostopno pm na 10pm / 2 na 50 / 4 na 100 / 6 na 200 / 6 na več kot 200 / +plus 1 na vsakih 100 dodatnih parkirnih mest)	14	Obvezno	Obvezna prilagoditev	Večji poseg v stavbi, brez potrebnih dokumentov, dražja izvedba	✕
✎	🔍	2	GO	Če je zagotovljeno le eno parkirno mesto za gibalno ovirane, ali je parkirno mesto tik ob vhodu?	8	Obvezno	Koristna prilagoditev	Večji poseg v stavbi, brez potrebnih dokumentov, dražja izvedba	✕
✎	🔍	3	GO	*Če ni parkirišča, ali je urejen prostor za kratkotrajno ustavitev vozila?	8	Obvezno	Obvezna prilagoditev	Večji poseg v stavbi, brez potrebnih dokumentov, dražja izvedba	✕
✎	🔍	4	GO	Ali je širina parkirnega mesta za gibalno ovirane najmanj 3900 mm?	14	Obvezno	Potrebna prilagoditev	Manjši poseg, cenejša izvedba	✕
✎	🔍	5	GO	Ali je dolžina parkirnega mesta za gibalno ovirane najmanj 5400 mm?	14	Koristno	Potrebna prilagoditev	Manjši poseg, cenejša izvedba	✕
✎	🔍	6	GO	Ali je prostor za izstop iz avtomobila, ki si ga delita dva sosednja parkirna mesta širok vsaj 1500 mm?	14	Obvezno	Koristna prilagoditev	Manjši poseg, cenejša izvedba	✕
✎	🔍	7	GO	Ali je parkirno mesto za gibalno ovirane blizu vhoda (oddaljeno do 50 m od vhoda)?	8	Obvezno	Koristna prilagoditev	Manjši poseg, cenejša izvedba	✕
✎	🔍	27	SL	Ali ima dostopna pot ustrezne talne oznake za orientacijo slepih in slabovidnih?	8	Obvezno	Potrebna prilagoditev	Manjši poseg, cenejša izvedba	✕
✎	🔍	28	SL	Ali je vidljivost dostopne poti izboljšana skozi uporabo kontrastnih površin in barv materialov?	9	Obvezno	Potrebna prilagoditev	Manjši poseg, cenejša izvedba	✕
✎	🔍	31	SL	*Če so na poti ali v stavbi (nevarni) predmeti, ki so nižji od 1000 mm, ali so dobro vidni in vizualno kontrastni z okolico?	17	Obvezno	Potrebna prilagoditev	Manjši poseg, cenejša izvedba	✕

Slika 6: Prikaz dela vprašanj v preglednem obrazcu (vir: zajem zaslona spletne aplikacije)

Slika 7: Prikaz podatkov o objektih na preglednem obrazcu (vir: zajem zaslona spletne aplikacije)

Slika 8: Prikaz vnosnega obrazca za vnos in razvrščanje elementov popisa (vir: zajem zaslona spletne aplikacije)

Slika 9: Prikaz obrazca za hitro odgovarjanje na vprašanja za zadevni element presoje (vir: zajem zaslona spletne aplikacije)

Popis ovir pred objektom in v objektu zahteva bolj kompleksen vnosni obrazec, saj mora ta omogočati dodajanje elementov, na katere popisovalec naleti v fazi popisovanja. Hkrati mora biti prilagojen za odgovarjanje na vprašanja z uporabo tablice ali pametnega mobilnega telefona. Zato je bil obrazec izdelan s skriptnim modulom Razor za programiranje dodatnih funkcionalnosti v programskem jeziku C#. Na sliki 8 je prikaz vnosnega obrazca za vnos in razvrščanje elementov popisa, na sliki 9 pa je prikazan isti obrazec, le da prikazuje odgovarjanje na vprašanja za zadevni element presoje. Obrazec za odgovarjanje na vprašanja omogoča dva načina vnosa odgovorov na vprašanje, na hiter in podroben način. V hitrem načinu popisovalec na tablici ali v pametnem telefonu le tapne odgovor na vprašanje, ki je lahko Da, Ne ali Ni pomembno. V podrobnem načinu (slika 10) pa ima popisovalec možnost dodati še sliko ovire in dodatne opombe, ki lahko pomagajo pri odpravi te.

Po končanem popisu in vnosu vseh potrebnih podatkov se samodejno ustvari prikaz dostopnosti objekta v javnem in vzdrževalnem modulu. V javnem modulu je prikaz na voljo vsem, ki želijo ugotoviti, ali je objekt dostopen in katere morebitne ovire jih čakajo ob vstopu v objekt in v njegovi notranjosti. Pri tem lahko uporabijo Vodnik, ki omogoča iskanje objektov po podatkovni bazi pregledanih objektov. V vzdrževalnem modulu pa imajo naročniki možnost pregleda morebitnih ovir za njihovo spremljanje in odpravo.

2.4 Četrti korak: testiranje metode z uporabo spletnega sistema za zajem in spremljanje podatkov

Testiranje metode je bilo v okviru izdelanega sistema izvedeno na številnih raziskovalnih (Sendi idr., 2015, 2019, 2021; Bizjak idr., 2021) in drugih projektih, pri čemer je bil eden izmed ciljev ugotoviti dostopnost javnih objektov za vse vrste invalidnosti. Testiranje je potekalo v štirih fazah:

1. najprej se je preverilo, ali je treba vprašanja o dostopnosti, ki so že vnesena v bazo podatkov, dopolniti ali popraviti glede na morebitne spremembe zakonodaje in standardov,
2. vnaprej so se pripravili sklopi vprašanj glede na vrsto objekta (športni, kulturni, objekti pravosodnih organov …) in njegove specifičnosti,
3. za testiranje na terenu se je uporabila elektronska tablica s povezavo do sistema prek mobilnih podatkov, za primerjavo se je uporabil tudi ročni sistem vpisovanja na natisnjene obrazce. Pri testiranju so poleg popisovalcev iz inštituta sodelovali tudi popisovalci invalidi (gibalno ovirani, slepi in slabovidni ter gluhi in naglušni). Popisovalci so pred začetkom popisovanja zaradi njegove kompleksnosti opravili kratek tečaj za popisovalce,
4. primerjanje rezultatov zajetih prek tablice in ročno na terenu po končanih popisih na terenu.

Med uporabo sistema je bilo do objave članka pregledano in v bazo podatkov vnesenih 286 objektov. V preteklem letu dni

Slika 10: Prikaz obrazca za podrobno odgovarjanje na vprašanja za zadevni element presoje (vir: zajem zaslona spletne aplikacije)

je spletni portal obiskalo 636 uporabnikov (od tega jih je bilo 89 % novih uporabnikov), zaznanih je bilo 16.469 obiskov različnih spletnih strani portala. Povprečni čas obiska portala je bil približno 13 minut v 1.191 sejah. 74 % uporabnikov je do spletnega portala dostopalo prek sistema Windows, 18 % prek sistema Android, 5 % prek sistema IOS in 3 % prek drugih sistemov.

3 Razprava

Dostopnost brez ovir je pravica prav vsakogar. Izhaja iz ustave, evropskih in drugih dokumentov. Dolžni smo jo zagotoviti tako v zunanjem kot v notranjem grajenem prostoru. Obvezno jo moramo upoštevati pri vseh novogradnjah, saj nam to narekujejo zakoni in standardi. Pri starejših gradnjah pa moramo odstraniti ovire, izvesti prilagoditve in vzpostaviti dostopnost za vse. Lastniki objektov in vzdrževalci bolj ali manj uspešno izvajajo zakone, ki jim narekujejo prilagoditve objektov, da bi zadostili splošni dostopnosti. Pri tem pogosto ne upoštevajo

standardov, ki zelo jasno narekujejo, kakšne morajo biti prilagoditve. Do zdaj za preverjanje prilagoditev, ali te upoštevajo veljavne standarde s področja ali ne, ni bilo metodologije in na njeni podlagi razvitega sistema za elektronsko preverjanje prilagoditev. Metoda, predstavljena v članku, je omogočila izdelavo elektronskega orodja, spletnega sistema, s katerim je mogoče preveriti, ali so prilagoditve skladne s standardi. Področni standardi so za katero izmed ovir celo preveč podrobni. Zato mora objekt popisati usposobljen popisovalec, ki razume, kako se v prostoru gibljejo funkcionalno ovirane osebe in na katere ovire lahko pri tem naletijo. Popisovalec lahko z uporabo spletnega sistema v zelo kratkem času preveri vsak objekt, ali je dostopen za funkcionalno ovirane osebe in ali prilagoditve ovir zadostijo predpisanim standardom. Če standard ne predvideva boljše rešitve, jo usposobljeni popisovalec lahko predlaga v sistemu.

Vendar so se med testiranjem pokazale nekatere pomanjkljivosti metode in na podlagi metode izdelanega sistema. Predstavljena metoda je namenjena podrobnejšemu popisu ovir, ki temelji na standardih. Podrobnejši popis omogoča natančen

pregled ovir in morebitnih prilagoditev. Najbolj koristi lastnikom in vzdrževalcem pregledanih objektov, saj s tako natančnim pregledom dobijo veliko uporabnih podatkov za odpravo in prilagoditev ovir. Manj pa koristi funkcionalno oviranim osebam, ki si želijo le pogledati, ali je objekt dostopen ali ne, saj je podatkov veliko preveč in se osnovni podatki o dostopu in morebitnih ovirah težko razberejo. Metoda je uporabna tudi za bolj preprost popis. Ciljno raziskovalni projekt Dostopnost objektov v javni rabi za potrebe invalidov (Sendi idr., 2021) je podal smernice za prilagoditev metodologije presoje dostopnosti za vnos preprostega popisa, ki temelji na predlaganih minimalnih standardih za doseganje dostopnosti. Vpeljava preprostega popisa v sistem bi lastnikom objektov, ki bi želeli vpisati dostopnost svojih objektov v sistem na podlagi predlaganih minimalnih standardov, omogočila samoocenjevanje. V tem primeru bo treba prilagoditi metodologijo in nadgraditi sistem, da bo omogočal vnos tudi preprostega popisa. Nadgradnja mora vsebovati možnost registracije in prijave v portal lastnikov objektov, iskanja po registru objektov za določitev šifre objekta, določevanje prostorskih koordinat objekta ter izbor namembnosti objekta. Ta bo vnašalcu podatkov omogočala prikaz vprašanj, ki so specifična za tipologijo in namembnost objekta. Tako pripravljena možnost vnosa preprostega popisa bo namenjena vsem, ki bodo želeli sami popisati dostopnost svojih objektov in njihovo dostopnost prikazati na spletnem portalu.

4   Sklep

Terenski zajem podatkov z uporabo pametnih telefonov ali tablic deluje, a deluje počasneje, kot je bilo predvideno. Zaradi zahtevnega izpolnjevanja vprašanj se odgovarjanje na vprašanja časovno podaljša. Terenski vnos bi moral omogočati hitrejše izvajanje popisa. Tudi prikaz na telefonih ni najbolj optimiziran, saj je v prvotni obliki namenjen bolj tablicam, ki imajo večje ekrane kot pametni telefoni. Uporabniki sistema, predvsem lastniki in vzdrževalci, so pozdravili možnost, da lahko vidijo ovire in da lahko vnesejo morebitno odpravo ovir. Kljub temu ima sistem za spletno spremljanje dostopnosti objektov še veliko možnosti za nadaljnji razvoj. Pohitritev terenskega popisa objektov prek tablice je ena od nalog, ki lahko nadgradijo sistem. Tudi uporabniško izkušnjo na telefonih je treba izboljšati. Na portal bo treba dodati tudi orodja, ki bodo slepim in slabovidnim olajšala uporabo spletnega sistema, metodo pa bo treba dopolniti, da bo omogočala tudi vnos preprostega popisa dostopnosti. Ko bo metoda v prihodnje dopolnjena, bo tudi uporabnikom, lastnikom in vzdrževalcem objektov omogočala samoevalvacijo. To bo pripomoglo k večji uporabnosti in večji prepoznavnosti spletnega sistema. Predvsem pa bodo funkcionalno ovirane osebe dobile na enem mestu standardizirane

podatke o dostopnosti objektov, hkrati pa bodo lastniki in vzdrževalci pridobili podatke, ki jim bodo pomagali odpraviti ovire ali popraviti prilagoditve, ki niso bile izvedene v skladu z veljavnimi standardi.

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Aslı ULUBAŞ HAMURCU

The metaverse, online communities, and (real) urban space

With the COVID-19 pandemic, technological advancements and investments accelerated to create an alternative to the real world that makes it possible for various activities and experiences to be handled online. Among these developments, the metaverse comes to the fore because it makes possible real and virtual experiences simultaneously, regardless of the time and space the user exists in, and it acts as a mediator and medium to bring these two environments together. This article discusses the possible impacts of advancements in the metaverse on (real) urban space considering the socio-spatial dialectic through theory synthesis and adaptation. An overall evaluation of the socio-spatial impacts of this is also included and opened up for discussion. Based on a literature review, it is expected that technological developments like the metaverse will introduce a new organization to physical and virtual socio-spatial relations, and new socio-technological groups will be created in them and by using them.

Keywords: metaverse, online communities, urban space, phygital, COVID-19 pandemic

1 Introduction

With the COVID-19 pandemic, technological advancements and investments accelerated to create an alternative to the real world that makes it possible for various activities and experiences to be handled online. The main reason behind this increase in technological advancements and investments can be inferred as the need to overcome the problem of interrupted processes due to restrictions during the COVID-19 pandemic that prevented people from using the physical environment: the (real) urban space (i.e. working spaces, public spaces, commercial areas, green areas, areas for entertainment, etc.; Lim et al., 2022). On the other hand, there already existed several platforms and applications that allow users to virtually experience places either via virtual reality or augmented reality glasses and headsets (as though they were there), or via PC monitors (only for viewing, watching, etc.). Online platforms (e.g., Facebook and similar social network sites, or SNSs), applications (e.g., Zoom, WhatsApp, Messenger, etc.), and tools (PCs, mobile phones, etc.) are used for communication among people and to ease the operations and activities that need to occur in daily life – although the "interaction" is limited to messaging, talking, and video conferencing.

However, the technical and physical limitations of these standard means of communication and interaction resulted in certain problems for users (see also Wiederhold, 2020). Different from these standard means of communication and interaction, the metaverse comes to the fore because it makes possible real and virtual experiences simultaneously, regardless of the time and space the user exists in, and because it acts as both a mediator and a medium to bring these two environments (physical and virtual) together. Compared to standard means of communication and interaction, a limitation that it overcomes is the loss of concentration and motivation while handling these activities and/or operations due to the loss of spatial reference (for an overview of the importance of spatial reference, see Moser et al., 2015). As Riva and Wiederhold (2022) state, via the metaverse, users "experience the sense of 'presence', that is, the feeling of 'being there', of actually being inside a place". Users can also create a virtual world that allows them and others to be part of the experience or to produce the experience together. Moreover, because this experience will be actualized in real time, the technical limitations faced by standard means of communication and interaction will be overcome. Via the metaverse, users are expected to interact with each other through physical and virtual means within virtually created environments and without the problems they face while using standard means of communication and interaction.

Although the term *metaverse* was introduced by Meta Platforms in 2021, the origin of the word goes back to Neal Stephenson's 1992 science-fiction novel *Snow Crash*. In *Snow Crash*, the protagonist moves between a dystopian version of Los Angeles and a virtual world called the metaverse (Kirtley, 2021), and the internet evolves into a virtual reality–based form, where people use their digital avatars to explore this virtual world to "escape" from the dystopian reality of their lives (Arapkirli, 2021). This is why the metaverse is also referred to as the next-generation internet, or NextG internet (Cheng et al., 2022). Actually, when examined, the earliest broadly accepted prototype of the metaverse was already introduced in the late 1970s as a text-based interactive game called MUD (multi-user dungeon; Cheng et al., 2022). Then, with the advancements in technology and the internet, development of commercial virtual worlds (e.g., Second Life, a 3D virtual world where users can interact with each other in real time and generate content themselves; Second Life, 2022a) and open-source server platforms, such as OpenSimulator to host these 3D virtual worlds (OpenSimulator, 2022), followed. What makes the current metaverse different from its earlier versions is that it is easily accessible anywhere and anytime through any mobile or digital means (S.-M. Park & Kim, 2022), and it can be developed by anyone that has the basic equipment, an internet connection, and knowledge. All in all, the current metaverse is simply defined as "an offline/online interface of a virtual set of worlds" (van der Merwe, 2021).

Recently, discussions have moved toward the metaverse being "a medium for exchanging interests and social interaction centred on content" (S.-M. Park & Kim, 2022: 4211), which is to be supported by 5G and mobile immersive computing (Cheng et al., 2022). With 5G, it is expected to connect "things everywhere – reliably, without lag" so that "people can measure, understand and manage things in real time" (Ericson, 2022). Therefore, billions of connected devices (the internet of things) will collect and share information in real time to solve problems of daily life activities and operations (Ericson, 2022). Likewise, with 5G, the metaverse is expected to come to life because 5G is dedicated to ensuring the infrastructure needed by mobile immersive computing to operate the flows of information that it acquires. It is even expected that various metaverses will be created, as in the case of the initiation of the internet (Haber Global, 2022). Cheng et al. (2022) define this process as "an open development phase of the Metaverse".

This open development phase of the metaverse is on the march. "Already, several companies including Microsoft, Roblox, and Epic are investing in their versions of the metaverse, supported by advancements in technology enablers such as 5G, artificial intelligence (AI), edge, and cloud computing" (Clement, 2022). Meanwhile, (real) urban space is being reproduced in

digital form (referred to as *digital twins*) on it (for an overview of *MetaCities*, which are virtual copies of existing (real) urban space, see Wang et al., 2022) so that the emerging virtual societies can live in, act, move and engage through it. To give an example from one of the earliest metaverses, which is Second Life, the total number of registered "residents" increased from 64,687,961 to 66,614,470 in only one and a half years (between 2020 and 2022; Second Life, 2022b; Voyager, 2021). These "residents" – or the online communities – are creating content or experiencing the created content in various topics; that is, shopping, adventure, fantasy and gaming, arts and music, recreational areas and facilities, business, historical assets, education and universities, non-profits and social awareness, hobbies, sports, and so on (Second Life, 2022a). They also come together and build (online) societies. These societies can also create social events and participate in them. Moreover, it is possible to earn money from these events because the content served can be bought and sold as non-fungible tokens with cryptocurrencies through a decentralized blockchain (Cheng et al., 2022). Nevertheless, these experiences served by the metaverse are not expected to critically replace current digital interactions, but are "likely to displace many of them while opening up new types of interactions and business models to optimise on these new use cases" (Nguyen, 2021). According to predictions by Gartner (Rimol, 2022), "by 2026, 25% of people will spend at least one hour a day in the metaverse for work, shopping, education, social and/or entertainment reasons" without any need for physical space at all.

Given the statistics and facts in several sources (Statista Research Department, 2021; Johnson, 2022; Wise, 2022), it is obvious that the metaverse is rapidly becoming an alternative medium for one-to-one, one-to-many, and many-to-many interactions for various activities. As also put forward by Hemmati (2022), depending on "the forthcoming developments . . . this technology would grow and have a deeper impact on human life in the coming decades". Thus, it can be presumed that the metaverse will be the new umbrella term for virtual spaces that physically and virtually bind today's newly emerging metasocieties along with the commercial, political, and social systems that are currently being rooted and developed in those virtual spaces. It can even be claimed that, if these applications, devices, and infrastructure keep on being developed and, as far as they are backed up with the network of interconnected experiences, the metaverse will replace certain activity spaces in the (real) urban space. In his 1995 book *City of Bits: Space, Place and the Infobahn*, Mitchell already determined some activity spaces transitioning under the impact of developing technologies as follows: bookstores to bitstores, stacks to servers, galleries to virtual museums, theatres to entertainment infrastructure, schoolhouses to virtual campuses, and hospitals to telemedicine. By 2025, with the advancements

in technologies that support the metaverse, and in information and communication technologies (ICTs), it will be no surprise to observe a critical change in these activity spaces in cities because the way of interacting – or, as defined by John (2017), "the way of doing things" – is changing and diverging. In this sense, the advancements in these technologies will change the way one-to-one, one-to-many, and many-to-many interactions are created, and they will change the medium for these interactions to occur (Ulubaş Hamurcu & Terzi, 2022).

Nevertheless, "these interactions are becoming more and more digital . . . and less in need of being place contingent" (Ulubaş Hamurcu & Terzi, 2022). Proceeding from this point of view, a few critical questions can be raised: Which of the urban uses will be replaced by new ones that will make possible the physical and digital experiences that are (or will be) provided by the metaverse? Will some of them be removed from the real urban areas because there will no longer be a need or a demand for them? How will they be adapted to this change and be reshaped to allow the use of the infrastructure, systems, and tools needed? The concepts of online communities and (real) urban space are delivered in reference to the related developing literature on the metaverse. Because the main aim is to discuss the possible impacts of advancements in the metaverse on (real) urban space, the sections are dedicated to identifying the changing meanings of these concepts considering the socio-spatial dialectic through theory synthesis and adaptation (for an overview of theory synthesis and adaptation, see Jaakkola, 2020). An overall evaluation of the possible socio-spatial impacts of this is also included and opened up for discussion. Conclusions are presented by leaving certain reservations.

2 The socio-spatial dialectic revisited: Changing meanings of online communities and (real) urban space

As the socio-spatial dialectic asserts, the production of space is a recurrent series of actions where one can be the subject or the object of the action based on the affirmation that social-based spatiality is both space-forming and space-contingent (Soja, 1989). This is a two-way interaction between human beings and the physical environment. With the advancements in ICTs, similarly, "the virtual world is becoming a wider expression of our personal and collective space, an interactive spatial dimension where at the very same moment we shape it, it shapes us" (Moneta, 2020: 48). Nevertheless, these actions occur in both the physical and virtual spaces, and they reveal a "fuzzy ground in-between the physical existence of a human being and his/her actions in the physical environment and his/her virtual identity (and actions) in digital networks" (Ulubaş Hamurcu & Terzi, 2022; see Figure 1).
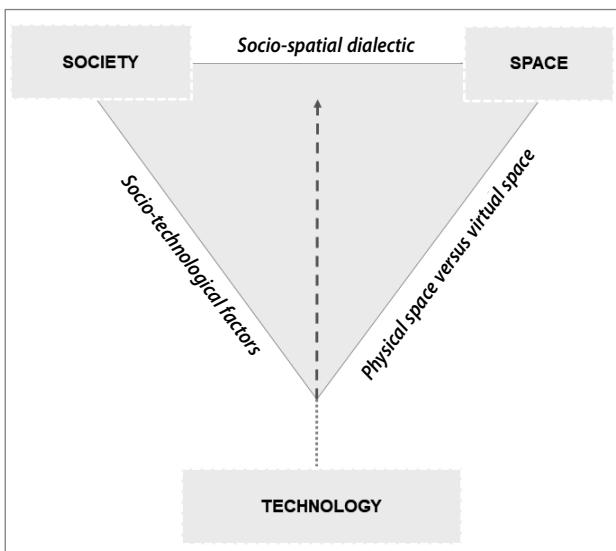
Figure 1: Society, space, and technology threefold (adapted from: Ulubaş Hamurcu, 2021).

The metaverse as a medium and a mediator for bringing both physicality and virtuality together stands on this fuzzy ground. Gaggioli (2017: 744) defines space that "originates from the increasing convergence of the physical environment and the virtual dimension" as *phygital* (a combination of physical and digital) and explains this concept as a transformation of "our living spaces – houses, offices, public places, and so on – in digitally enriched environments that blur the distinction between the 'real' and the 'simulated'". Unsurprisingly, ever-growing technologies such as augmented reality, the internet of things, robotics, and artificial intelligence are the mediators of this transformation. In this sense, the metaverse is also classified as a phygital space because it offers a new virtual reality by utilising an application, tool, or product (van der Merwe, 2021). In addition, as Gaggioli (2017: 744) states, "the integration of computers in everyday objects and the increasing bidirectional information flow between the digital and the physical realm is transforming our surrounding environment (including even our bodies) into a seamlessly programmable interface, where virtually every object can be creatively reconfigured to provide new kinds of phygital experiences".

In the case of the metaverse, these phygital experiences as part of social-based spatiality are produced both physically and virtually in real time regardless of the locations of the users. On the one hand, users are space boundless (or place independent) to become connected to it and to interact in it. However, they are still physically and digitally connected to the tools and infrastructure that enable them to (have) access to the immersive environment on the metaverse, where they are gradually becoming attached. Therefore, first, the changing nature of place-independent interactions of users along with

advancements in the metaverse are described in Section 2.1. Following this, the status of (real) urban space is examined in Section 2.2.

2.1 From online communities to metasocieties

Online communities are defined as a "collective group of entities, individuals, or organisations that come together either temporarily or permanently through an electronic medium to interact in a common problem or interest space" (Plant, 2004: 54). Users conceive online communities as "a tool", "a way of being", and "a place" (Markham, 1998). They use online platforms and SNSs to represent themselves by creating digital avatars, which replace their real selves, and to act in a virtual space in the way they desire through infinite possible actions (Liboriussen, 2012). Therefore, these online platforms and SNSs are not only basic tools for entering the virtual environment but are also the "space" themselves where these online communities gather. Along with developments in ICTs, today the metaverse is unavoidably becoming both the mediator and the medium for those offline interactions so that they can cultivate various metasocieties, come together, and spread. As Berg (2012: 176) summarizes, standard SNSs only help their users "establish social relationships and perform a self-presentation, observe each other and exhibit social relations through the graphical user interface". However, they are still a mediator, not a medium. With the metaverse, the aim is to assign such online platforms a new task, which is to house the online communities; that is, to turn them into a medium for these online communities to participate in by experience. As mentioned by Wang et al. (2022: 5), metasocieties will run in parallel to real societies, and "any human, enterprise and city in the real societies will have corresponding virtual human, virtual enterprise, and virtual city, respectively". Hence, metasocieties will enable virtual-real interactions at the same time. These virtual–real interactions will also produce their relative spatial representations. Berg (2012) defines this differentiation between the physical and the digital as having both ontological and practical conditions of social interaction. However, with advances in ICTs, the boundaries between physical and digital interactions are blurring and thus between the physical and digital spaces because the interactions are being bound to and shaped by them (as affirmed by the socio-spatial dialectic). All these advancements in technologies instrumentalize the production of phygital spaces mediating phygital experiences.

The concept of Society 5.0 is proposed as making possible "a high degree of convergence between cyberspace (virtual space) and physical space (real space)" (Cabinet Office, 2022). It is a "human-centred society that balances economic advancement with the resolution of social problems by a system that high-

ly integrates cyberspace and physical space" (Cabinet Office, 2022). Society 5.0 is the initial stage to which existing standard online communities are targeted to evolve as a part of the advancements in the metaverse and related technologies. Certain objectives are put forward to be achieved by Society 5.0: 1) to enable it for the benefit of everyone regardless of age and sex; 2) to liberate people from cumbersome work and enable them to use their time effectively; 3) to provide time for spare-time activities; and 4) to provide more convenient, safe and secure living environments (Cabinet Office, 2022). The metaverse, as a service, aims to share sustainable content and social meaning (S.-M. Park & Kim, 2022). Thus, Society 5.0 is to be implemented via the metaverse, which will be used as both the mediator and the medium.

If Society 5.0 is actualized, then this might end in a new socio-spatial turn. It should not be forgotten that the development of the social web and SNSs ended in a social turn in the way the internet is perceived (Berg, 2012). For Berg (2012: 175), in contrast to digital space being conceived as a separate social realm, "current conceptualisations increasingly situate digital space as deeply embedded in everyday life and as a challenge to the contemporary modes of societal organisation in physical space". Likewise, with the emergence of locative technologies, a spatial turn has also occurred (Castells, 2004; Jansson & Falkheimer, 2006; Wilken, 2008; Berg, 2012). As discussed by Graham (2004), these technologies are anticipated to cause the dissolution of cities and trigger spatial homogenization and transmission of place as a part of the change that will occur in social systems. He explains the reasons behind this as passing from physicality to virtuality and casting away material bodies to extend the individual being of humans. However, as the socio-spatial dialectic suggests, the social entity and the physical entity cannot be examined as two separate variables of the production of space. They are intertwined and none is the dominating factor over the other. Thus, with the metaverse, the discussions on the social turn and spatial turn should widen to cover socio-spatiality (as also suggested by Berg, 2012) as a means of intertwining virtual and physical social relations and interactions (or phygital experiences) exerted on the blurring boundaries and spatialities of real urban space and virtual space (or phygital space) under the impact of socio-technological factors (see also Ulubaş Hamurcu, 2021 and Ulubaş Hamurcu & Terzi, 2022). An overview of the possible outcomes of these factors on (real) urban space related to the metaverse is further discussed in Section 3.

2.2 From (Real) Urban Space to MetaCities

Kemec (2022) states that "with Metaverse applications, a new experience has been experienced in business, shopping, edu-

cation, sports, social, cultural, and artistic activities in cities". These multiple functionalities of the metaverse are realized through the means of digital twins. Digital twins are "large-scale and high-fidelity digital models and entities duplicated in virtual environments" and "reflect the properties of their physical counterparts" in the real urban space (Lee et al., 2021: 1–2). They make possible "heterogenous activities in real-time characterised by unlimited numbers of concurrent users" (Lee et al., 2021: 2). Therefore, it is not possible to fully cover all these phygital spaces and experiences (also considering that it is still the open development phase of the metaverse), but it is possible to list some of them to imagine the future they offer.

Mac Ghlionn and Hamilton (2022) exemplify a phygital experience on the metaverse as follows: "Decked out with full-spectrum [virtual reality] headsets, smart clothing and tactile-responsive haptic gloves, the at-home traveller can touch the Parthenon in Athens or taste the rich foam of a Korean dalgona coffee". There are also examples in economic, educational, governmental, and even religious systems. The transition to remote working spaces on the metaverse during the COVID-19 restrictions can be given as one of the remarkable and concrete examples of the socio-spatial impacts of it on (real) urban space. Meta built Horizon Workrooms to hold online meetings, and Microsoft is planning to integrate its virtual reality and augmented reality platform Mesh with Teams (Lawrence, 2021). Platforms like Gather, Teamflow, and Virbela seek to make possible online gatherings and ease the problems that are faced on standard means of communication and interaction that only permit viewing each other from a computer screen. Similarly, the research by Choi (2022) suggests a significant difference between the use of standard means of communication and interaction and the metaverse in the preference of employees regarding remote work conditions. With regard to educational systems, there are examples that seek to bring together different participants from different organizations and geographies to collaborate on mutual projects (Suzuki et al., 2020) and consider the metaverse a medium for sustainable education, which is free from certain pre-defined constraints like time and space (S. Park & Kim, 2022). Seoul is the first major city to announce preparations for establishing a metaverse platform to fulfil economic, educational, cultural and tourism, communication, urban development, administrative, and infrastructure tasks considering the trends and demands of public and private sectors (Seoul Metropolitan Government, 2022). By 2023, it is aimed to provide convenient consultations and civil service on the metaverse, which is currently being provided by public officials in Seoul City Hall. Even a church exists on the metaverse to allow worship and offer prayer services (Dsouza, 2022). Nevertheless, how many of these virtual environments and related online communities

will be adapted and used, and for how long, remains unclear because it is still the open development phase of the metaverse.

3 Discussion: An overview of possible socio-spatial impacts of the metaverse

The COVID-19 pandemic demonstrated that, in certain situations, we are constrained by technological means in various ways (Ulubaş Hamurcu, 2021). With the COVID-19 pandemic, we observed ICTs become a mandatory part of our daily lives. Especially due to lockdown, all products and services began to be sold or provided on the internet, just a click away. This unexpected mandatory use of ICTs changed the presumptions made regarding the impact of newly emerging technologies and products in the technology market (Panetta, 2021). It also changed the discussions on their adaptability and usability by users and their socio-spatial impacts on cities (Ulubaş Hamurcu, 2021; Ulubaş Hamurcu & Terzi, 2022).

Existing (real) urban space is under the influence of changing ways of doing things based on advancements in technologies (John, 2017). On the one hand, it is expected that certain socio-technological groups will try to improve their conditions to acquire such technologies and use them more effectively and efficiently to overcome their daily life activities and tasks (Allam & Jones, 2021; Ulubaş Hamurcu, 2021). In such a case, certain land uses in real urban space might be – or aimed to be – replaced by digital twins. Such services or uses might be served virtually. They include business, education, entertainment, and public/governmental services and facilities. Examples have already been discussed in Section 2.2. On the other hand, the unexpected mandatory use of ICTs during the COVID-19 pandemic is also expected to evoke the importance of (real) urban space, and users will expect higher-quality urban areas, infrastructure, and services to be provided by local administrators (Allam & Jones, 2021; Ulubaş Hamurcu, 2021). However, in such a case, the metaverse will still be on the agenda of urban planning and design practices. Virtual simulations on it can be used to generate parallel versions of cities to test the policies and visions developed by (local) governments (Devisch, 2016; Martynova, 2020), to search for better solutions to the problems in cities, or to ease existing systems. One can benefit from digital twins, which provide several significant opportunities for early-stage collaboration and rapid optioning (Nazir, 2020) for decision-making processes. Bizjak (2012) suggests that tools that can be applied to e-participation in spatial planning and design should be improved.

Nevertheless, there is still another option. For Roy (2020), "historically, pandemics have forced humans to break with the past and imagine their world anew. This one is no different. It is a portal, a gateway between one world and the next". In this sense, designing and planning mixed-use areas, which make it possible for multiple physical and virtual actions and interactions to occur simultaneously, will appear on the agenda of cities (Ulubaş Hamurcu & Terzi, 2022). Along with the actualization of the metaverse, the services and the physical environment served to the users will adapt to facilitate its necessities. Related professions, developers, and local administrations will have to catch up with the upcoming technological developments and adapt them to the physical environment. In addition, new urban areas and spaces might emerge to mediate these necessities. Because entering the metaverse only requires certain equipment, such as virtual reality glasses, mobile phones or PCs, and an internet connection, then the space required for handling certain activities (e.g., shopping, recreation, education, and work) might decrease, or, based on the type of activity, it might even increase to allow the movement of the user while using virtual reality and augmented reality glasses and headsets. Therefore, the socio-spatial impacts of the metaverse will diversify based on certain premises.

It is also crucial to list some of the current limitations of the metaverse. Among these are 1) lack of commonality, continuity, and global standards; 2) problems of accessibility, inclusivity, and global connectedness; 3) low levels of social acceptability; and 4) the gap between the latest technologies and the requirements of the metaverse. Every platform on the metaverse is operated by separate entities, and there is no unified system (Lim et al., 2022). Therefore, the continuity of such platforms will depend on the service they provide or on the commonality they create. In certain cases, owning a smartphone and having access to the internet is sufficient for immediate access to these platforms. However, some may have specialized requirements for access, such as a signup process, paid subscription, unique identifier, and digital wallet (van der Merwe, 2021). Therefore, it should also be discussed whether the metaverse can achieve its aim of providing sustainable content and social meaning as part of Society 5.0 considering the discussions on the digital divide and literacy. Moreover, to create, provide, and develop sustainable content and social meaning, eventually the metaverse should be socially acceptable. For Lee et al. (2021), privacy threats, user diversity, fairness, and user addiction will define the sustainability of the metaverse, and therefore there will be a high need for complementary rules and norms to ensure security and provide privacy. Moreover, it is becoming crucial to include generations other than Generation Z, which is the primary adopter of the metaverse, by explaining the possible advantages of the metaverse compared to the standard means of communication and interaction (Kovach, 2021). Lee et al. (2021: 3) claim that "the advent of [augmented reality]

and [virtual reality], high-speed networks and edge computing, artificial intelligence, and hyperledgers (or blockchain), serves as the building blocks of the metaverse". However, they also emphasize the gap between the latest technologies and the requirements of the metaverse that will integrate the virtual world into the everyday lives of people. Moreover, 5G infrastructure is still unavailable in most places. Therefore, whether the metaverse will survive or not depends on the advancements, investments, and borders of technological and technical infrastructure and services, and on their economic and geographical accessibility by the majority. Thus, owning the specified equipment is not the only prerequisite to being able to enter the metaverse and use it efficiently.

4 Conclusion

Because of the diversification of the phygital experiences and spaces that online platforms allow users to participate in and experience, the needs of the metaverse will differ from today's and they will diverge in parallel with its cultural, economic, social, technical, and political content. The possibility of the emergence of infinite and various hetero(chrono)topias leaves certain reservations regarding global policies and economies. Because there is no commonality in developing the metaverse, its future is fuzzy. Nevertheless, developments like the metaverse will introduce a new organization to physical and virtual socio-spatial relations. As Allam and Jones (2021: 3) state, "the more the innovation, the less the human engagement, and the more that the digital illiterate or 'luddites' are struggling with in comprehending and navigating this new realm". Therefore, such socio-technological groups will try to adapt themselves to these devastating changes, and the digital literacy and divide discussions will eventually move toward overcoming this problem and finding solutions for supporting social sustainability.

In addition, advancements in technologies will affect the notions of place attachment and place dependency (Ulubaş Hamurcu, 2021). As mentioned before, place dependency is merely shaped by the infrastructure and services provided to users. However, place attachment is a different notion. Place attachment may be both toward a physical or a social entity and even at the same time (Ulubaş Hamurcu, 2021). The metaverse is targeting the way attachment is exerted by users and the entity this attachment is exerted on. Thus, the level of adaption to the relationships and services provided by metasocieties and the virtual space they provide will have a critical socio-technological impact on the future of (real) urban space. Even these will end up in the formation of new socio-technological groups within real societies. On and by using the metaverse, these socio-technological groups are being created asynchronously and unbounded by physicality. Thus, it is crucial to analyse these groups to understand their expectations from both the metaverse and real urban space to determine the socio-spatial impacts of this phygital experience as a part of further research.

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Playgrounds in the digitally mediated city: An approach from augmented reality

Today, the use of technological devices is commonplace among children, which has also diminished children's presence in the city. Although children, as novel citizens, develop some of their skills (such as social, mental, and educational skills) in the city, many children face some kind of city exclusion. Therefore, the way the physical environment of their city is shaped and how children interact with it plays a principal role in child engagement. A child-friendly city can be a place to engage children using contemporary tools such as augmented reality (AR), which helps children communicate better and fosters abilities such as spatial cognition and physical and social skills in the physical and digital world. This study explores various examples and analyses the child-friendly city features of each. This article presents AR and its capabilities as a potential tool utilized in the city to pave the way toward a child-friendly mediated city – an inclusive social urban environment where children play or spend their leisure time and effectively mature into adulthood.

Keywords: augmented reality, child-friendly cities, urban perception, digital cities, digital social engagement

1   Introduction

Urban environments are becoming primary contexts in which new generations of children will flourish, following the current trend of global urbanization and the growing attraction of cities for families with children (Aji et al., 2016). By 2025, the UN estimates that 60% of the world's children will be living in cities (Krishnamurthy, 2019). UNICEF has defined the notion of a child-friendly city as a city where the children are actors with the ability to influence policy as citizens and which is a guarantor of all children's rights. Children can also participate in family, community, and social life, as well as receive basic health and education services while remaining safe from human trafficking, brutality, and mistreatment. Based on this concept, children have the right to feel safe on the street while meeting and playing with their friends, live in a non-polluted environment, participate in social and cultural activities, have accessibility to green spaces, and, regardless of their ethnicity, be able to access relevant services (Ceren Mavikurt, 2019).

Meanwhile, over the last few decades, rapid technological advancement has resulted in a new wave of emerging technologies that are poised to change both personal and professional experiences in urban spaces (Luusua, 2016). One of these digital technologies is augmented reality (AR), which has appeared in various fields, including architecture and urban design. Today the use of technological devices is prevalent among children and has been documented in many countries by numerous researchers in recent years. Touchscreen devices such as tablets and smartphones have become significantly more commonplace during the past decade. More recently, the COVID-19 pandemic has influenced the rhythm of city life and substantially decreased people's presence and activity, especially in urban areas. Although the lifting of restrictions has gradually returned cities to their normal state, this period has nonetheless caused increasing interaction of children with digital devices (Romanillos et al., 2021). Nowadays, the amount of time that children spend on mobile devices is increasing. According to data from the United States, in 2020 97% of households had at least one smartphone, 75% of families owned a tablet computer, and 44% of young children had their own tablet computer (Konca, 2021). These findings show that in many developed countries even a very young child can communicate with technology and spend a significant amount of time using it. However, the other side of the coin of children being entertained at home with a tablet, a mobile phone, or other technologies is their diminished presence in the city. Some AR games such as *Pokémon Go* require the user to move around the city to explore Pokéstops and catch items, thus increasing the users' activity time and consequently improving their overall health and wellbeing (Potts et al., 2017; Oduor & Perälä, 2021).

This article investigates AR as a technology choice that children can engage with, as an interface to encourage children to be in the city, and as an enabler of various factors of the child-friendly city. Below, we investigate three examples that show how AR applications can help realize some child-friendly city features that children can experience in their city to gain various useful skills through their presence in an urban environment enhanced by the digital world. The analysis of the examples also exhibits features that can help engage children with the city to further develop and foster their interaction with their urban environments. The practices in this article are examined in developed countries but, due to the rapid development of technology around the world in the future, similar cases could be identified in most parts of the world.

The research questions are as follows:
Q1: How can children improve their urban spatial perception with AR?
Q2: How can today's children become absorbed into the city and develop various skills via AR?

In line with the aim and research questions of this review article, the literature review extracted from books, articles, and theses is based on keywords such as *augmented reality*, *augmented reality and child development*, *children's presence in urban environments and their perception of it*, and *child-friendly cities*.

1.1   Literature review

Researchers around the world have worked to develop theories, facts, and experiences to explain and illustrate the characteristics, features, and capabilities of AR, which has attracted attention to its potential over the past decade. This review article adds to the research exploring the relationship between the city, technology, and play, developed in a doctoral programme. For example, Navarro Redón (2020) and Roig Segovia (2014) investigated the relationship between play space in the physical world and videogames, and augmented environments as a common ground of digital technology and traditional spatial structures in line with the convergence of physical and digital environments.

Regarding conceptual aspects of AR and its features, one can mention the studies by Mackay (1996), Azuma (1997), Ariso (2017), Saßmannshausen (2021), and other scholars that have explained this technology as a tool that exists in different fields and offers users the possibility to see the physical world enhanced with virtual objects superimposed upon or composited with the physical world (Ariso, 2017; Saßmannshausen et al., 2021). These studies also mention that AR helps users improve their physical, spatial, and mental skills. Nijholt (2017a) takes

a look at playfulness and playability in smart and intelligent cities, addressing pervasive games, urban games that change a city into a "gameful city", urban experiences, and how to involve residents in urban city design and development. Nijholt also mentions the playful hacking of smart city technology, mischief in smart cities, and playful interactions between residents and smart city technology in public spaces.

1.2 Children and urban space

Children need to gain experiences in various environments – such as the home, school, and urban environments – to develop their abilities and skills. Outdoor activities are an opportunity for children to experiment freely, run, climb, and jump to explore the world. To this end, cities as an outdoor space play an important role in children's health, wellbeing, and development. Furthermore, urban spaces can provide opportunities for children's play, social interaction, and independent mobility (Kyttä et al., 2018). Historical data show that while growing up children use the same urban spaces as adults, such as buildings, bazaars, public spaces, and pathways (Nooraddin, 2020). Compared to adults, children probe their environments by being more physically active and playing in various ways, such as climbing, jumping, and balancing. In this way, children communicate with their environment through their preferred forms of activities while enjoying their time in that space. Streets, as an urban space used by children as a playground, are a place to spend time with peers and encounter adults. In the early 1960s, Jacobs (1961: 81) wrote that children need "an unspecialized outdoor home base from which to play, to hang around in, and to help form their notion of the world". Streets and alleys could be exactly this type of space. While in the street, children can explore their social relations, improve social competencies, and gain independence. Furthermore, streets provide a variety of playing choices for children such as ball games, wheeled toys, and equipment brought from home (Gospodini & Galani, 2006). The other spaces that children use in the city are playgrounds. Playgrounds are specialized open spaces in towns and cities that are designed for children. The concept of playgrounds arose during the nineteenth century, when the rapid growth of urbanization occurred (Metin, 2003). Aldo Van Eyck was one of the pioneers in playground design. Cities, architecture, and playgrounds for children were his main subjects, which led him to introduce the concept of the city as a playground around sixty years ago in Amsterdam (Kim et al., 2017). Aldo Van Eyck playgrounds are simple and contain familiar shapes that children can easily perceive and communicate with (Lidón de Miguel, 2015).

In the early 1970s, the *Growing Up in Cities* project by Kevin Lynch in collaboration with UNESCO investigated how children's utilization and understanding of the environment affects their behaviours and characteristics. That study showed that children learn to use the urban environment as a learning ground through roaming and playing in the city. The study was revisited, expanded, and performed in several more cities during the 1990s. The study also found that children that are involved in the social and cultural life of their city acquire a sense of belonging and a strong personal identity (Bourke, 2012). Nowadays, technology plays an important role in various aspects of children's lives, such as in games, relations with friends, and education. Children's familiarity with technology develops day by day, and the technologies that children use today have also substantially changed from past decades. Children use a variety of digital technologies for gaming, including video game consoles, computer games, games on phones and tablets, handheld video games, and augmented reality and virtual reality games on various platforms (Flynn et al., 2019). Compared to the previous generation, today's children also start their interaction with the digital world at earlier stages of their development of environmental perception. This further emphasizes the digital divide between generations. However, as a result of children being entertained with technology at home, their presence in the city is slowly diminishing. Developing the use of technology toward improving the mental and physical activity of users in urban environments may be a solution to this issue. As residents of the digital city, children can also be entertained by healthy experiences using such technologies. In this way, children can become fonder of and more satisfied with the environment, which in turn improves their quality of life and encourages them to engage more with the city environment (Nijholt, 2017b).

1.3 Children's urban perception: the obsolescence of traditional public space

Traditionally, perception has been understood as the process by which people receive information, process it, and utilize it to understand their environment. In this regard, Kotler (1974) defines perception as a thought process that involves receiving information, selecting, categorizing, and then interpreting it. People can communicate with the environment by taking part in it and obtaining information to perceive their surroundings. Norberg-Schulz (1966) states that people's immediate awareness about their environment is obtained through perception. This process helps humans understand, translate, and draw relationships with their surroundings.

Children recognize their environment and perceive it using tactile, auditory, and visual senses, and they develop environmental cognition by observing, questioning, and using their skills over time (Duzenli et al., 2019). Children's growth and skill development is substantially influenced by their interaction with the environment. They learn and become familiar

with urban space through cognitive, affective, and evaluative means. Cognitive development occurs with the child's recognition of play spaces and discovering spaces, facilities, and features. Affective development is gained through awareness and sensitivity to physical and environmental factors. It also alludes to positive feelings and emotional attachments to a place (Aziz & Said, 2016). Finally, evaluative development considers the relation of values of nature to child development. Among those values are aesthetic values (physical attraction and appeal of nature) and humanistic values (emotional affection for nature), which familiarize children with nature and inspire them to form a sense of closeness to it. Children in the urban environment become sensitive to its features, which permits them to explore space and communicate with it (Kellert, 2002). Children's experiential perception of the environment gives them the chance to experiment with various skills while growing up and helps them further develop their knowledge (Sulaiman & Ibrahim, 2019).

2 The opportunity of a child-friendly city

Creating cities for everyone and considering children's needs in particular was introduced by a UNICEF initiative in Italy in 1996 (Titis Rum Kuntari, 2018). To address the inadequate attention paid to safe, secure, and healthy living conditions for children, a workshop was held the same year during the International United Nations Habitat II Conference. In this workshop it was reported that in a healthy habitat children's wellbeing is the ultimate indicator of a healthy environment, decent governance, and democratic society (al Arasi, 2013).

The concept of a child-friendly city is not based on a predetermined end state or closed scenario. This concept is a template for every city to use to make its environment, governance, and services more child-friendly. International conferences in recent decades have led to the drafting of Agenda 21 – an action plan from the United Nations Conference on Environment and Development (United Nations, 1992) – and the Habitat Agenda from the Second United Nations Conference on Human Settlements (United Nations, 1996). Most recently the series of documents A World Fit for Children (UNICEF, 2008), intends to make cities and communities more child-friendly through children's collaboration, proposing legal obligations and responsibilities for families, institutions, and governments toward realising children's rights (Ceren Mavikurt, 2019). Children as residents of the city have their own perceptions toward their city's surroundings, and their needs should be considered in the city's design. Tonucci (2015) stated that a suitable city for children is an optimal city for all. Along the same lines, Ward (1979) emphasizes the importance of city

design appropriate for children, which makes it convenient for them to live alongside other generations.

3 AR and child development

These days, AR is a technology that has been described as a live, direct, or indirect physical view of a real-world environment. AR includes the overlay of computer graphics on the physical world, whereby its elements are augmented or supplemented via videos, sounds, GPS data, or graphics created by computer-generated sensory input (Hammad & Srivastava, 2017). As the virtual and physical worlds merge, a new type of physical space emerges, which could be referred to as an augmented urban space (Mesárošová & Hernández, 2018).

Digital technologies have been widely used by children at an increasingly rapid pace over the past decade. This generation is society's future; children play a vital role in society's development and constitute a substantial customer base for the latest technological advancements. Children in most developed countries can use contemporary technologies to play games, speak with friends, tell stories, and learn, which introduces new dimensions to learning, communication, and social interaction (Mridha, 2018). Furthermore, the effects of digital age on children's lives are now more pronounced than ever because children are exposed to such technologies from a very early age in their homes and communities. Hence, children's lives, experiences, and opportunities are becoming increasingly mediated by their use of digital technologies (Marsh et al., 2019).

AR can help children interact with their environment and the virtual world. This communication can foster spatial cognition and physical and social skills (Gómez-Galán et al., 2020). With AR, children have the potential to learn about spatial content, which means that children can explore and understand spatial relationships between digital and physical objects located in mediated cities (Parmaksiz, 2017). AR also enhances the perception of the physical world and complements reality with additional sensory input to enrich children's senses of touch, sight, and hearing, and it enables them to see and/or hear beyond what already exists in the physical world (Bozkurt, 2017; Kiryakova et al., 2018). AR can simulate physical entities to attract children and at the same time help them experience imaginative participation and cognitive interaction. Furthermore, AR helps children's psychological development and arouses their desire to learn (Chen et al., 2017). According to Hedley and Shelton, AR interfaces are a combination of procedural and configurational knowledge. This technology is procedural knowledge because of the immersive senses that users can experience through the 3D display while standing or moving inside a mixed reality world. The configurational knowledge of AR is

due to the interaction experienced by learners while holding a 3D model in their hands and observing the geographical space (Hedley & Shelton, 2004). With AR, children can thus perceive their environment and learn many things to develop their abilities and skills. On the other hand, because children are inherently attracted to using new technologies, tools such as AR should be utilized in a positive and appropriate way to help them improve their skills and get ready for participation in society. When used as a teaching tool, AR can also help children develop social, physical, and spatial skills.

If sufficient supervision and control are not imposed, these types of technologies can cause some negative effects on human health, and other problems for children, such as physical inactivity and addiction to technology use (Ng & Ma, 2019). If used incorrectly, AR, just like many other technologies, can make users dependent on their devices and distance them from society in the physical world. Because it is inevitable that children will use digital devices in today's world, when used appropriately AR can be an opportunity for children to interact with the physical world. In some cases, AR can also encourage children to engage in physical activities. Although this has some complexity, it will conceivably be mitigated through advancements in technology in AR gadgets and applications, and the skills of the generation of digital natives.

4   Examples studied

Minecraft Earth, EduPARK, and UrbanAR have been selected as examples due to the opportunities they provide for a child-friendly city with augmented features and also the opportunities they provide for children in fostering and developing various useful skills using AR in the urban environment. Some child-friendly city features that children can collaboratively experience in the physical and digital world are analysed and compared for these examples.

Minecraft Earth is an AR game that was developed by Mojang Studios in 2009; it ended its support for the game in June 2021. This game brings a blocky construction set into the physical world. Minecraft Earth users do not pursue any specific goal; they can merely create, build, and explore in freedom while playing alone or cooperatively in a real territory or in an environment created by the players (Riordan & Scarf, 2017). Here, the user can develop a scaled-down version of the intended AR creation on a table indoors, like when assembling a Lego set, and then lay it down outdoors, where it scales up to real-life dimensions. These virtual structures are steady and set to a specific location, letting any other player that visits that place admire or disassemble and rebuild other people's creations. Minecraft Earth can be a collaborative environment

in which multiple users can brainstorm and cooperate to make virtual creatures and structures (Irving, 2019).

In Minecraft Earth, a user can invite a friend using a QR code so that they can work together on a creation. This way, friends nearby that have the game installed can scan the QR code and join the buildplate and interact with others (Warren, 2019). This AR game forms communities and groups that share creative creations, demonstrating the social aspect of Minecraft Earth (Riordan & Scarf, 2017). In this digital world, children can bring their imagination to life using digital representations of various materials. Furthermore, they can play, learn, and explore various skills in this augmented space, which they can identify with and own. Minecraft Earth allows users to build creative structures such as buildings, streets, sidewalks, urban parks, entire cities, and landscapes, or even elements of the environment such as forests, trees, and other components. The base of these constructions can be real or fictional spatial contexts, which allows the players to create an environment that shows a city, a landscape, or any other place on Earth (de Andrade et al., 2020). Based on children's opinions about this game collected from November 2019 to December 2021 on the Common Sense Media webpage, children like Minecraft Earth because it is fun and is an educational game for them that develops their art, creativity, and motor skills, and it is also appropriate for children of all age groups (Common Sense Media, 2019).

The EduPARK project is an AR geocaching game that develops technology-enhanced learning environments. Geocaching is another similar game that is based on a global positioning system (GPS) receiver, the internet, and users' ability to discover their environment. In this high-tech treasure-hunting game, users hide a cache (typically a small waterproof container) in a location and post its coordinates along with some clues on the internet (Mcnamara, 2004: 9). In the EduPARK game, a quiz with multiple-choice questions has been provided alongside content such as images, text, or audio. The game encourages the players to go to specific locations in the park and find the temporary markers or the physical caches with markers. EduPARK has four stages, each one corresponding to a path with multiple-choice questions that the players should answer based on the app's map (Pombo & Marques, 2018). The game also contains AR markerless tracking, which provides more opportunities for contextual and realistic learning in the park. Players receive a clue to a virtual cache at the end of each stage that, if found, rewards the players with points and virtual objects, which can be traded for assistance with the questions. In a survey of children that had used this game, children's perception of the game was positive. In this study, 90.2% of children had the opinion that the app helped them learn about their environment by showing them physical world information, and

Figure 1: a) selected screens of the EduPARK app and game (source: Pombo & Marques, 2021); b) plaque with an AR marker, next to a botanical specimen (source: Pombo & Marques, 2017: 176).
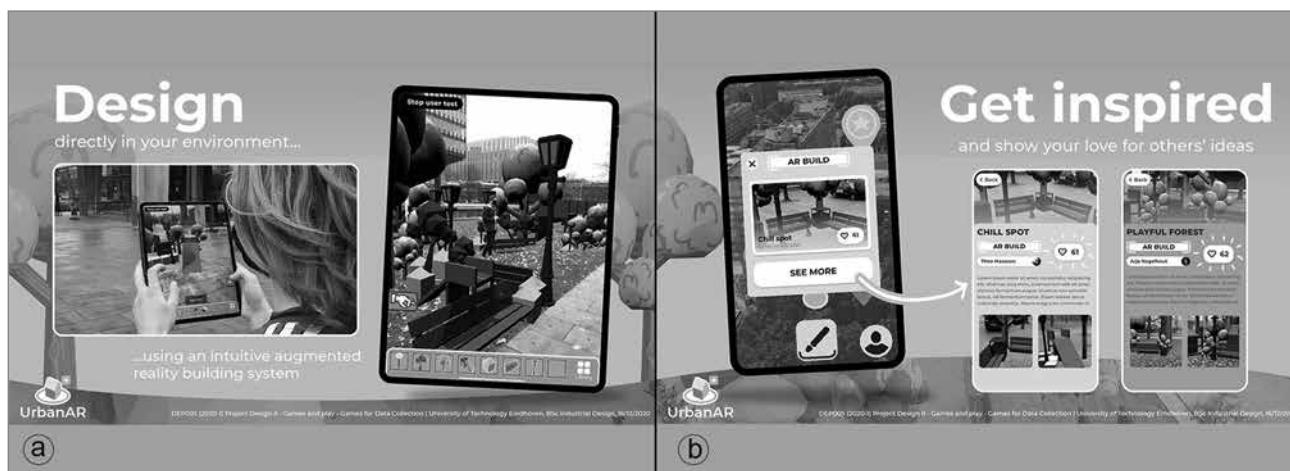

Figure 2: a) selected screenshots of the UrbanAR app (source. Dutch Design Daily, 2020); b) sharing ideas with other users (source: Dutch Design Daily, 2020).

Table 1: Examples and their features.

	Opportunities through AR (digital + physical world)	Child-friendly city features
Minecraft Earth	Encouraging children's collaborative practices versus isolated digital practices	Forming communities and groups that share creative creations
	Fostering children's social skills by brainstorming and cooperating through creative processes	
EduPARK	Learning about environmental contexts in the digital and physical world	Educational experience
	Training children's perception (touch, sight, and hearing) to allow sensing capacities beyond the physical world	Accessibility to green spaces
UrbanAR	Users visualize their ideas in the physical world	Effect of people's decisions on planning and building their city
	Collective collaboration in the urban design process	People express their point of view about urban features they like

Source: Authors (2022).

86.9% of children generally had a good feeling about using this app for learning purposes (Marques & Pombo, 2019).

UrbanAR is an application that utilizes AR to make urban design more accessible to all by allowing people to express their opinions while having fun using it. This project allows people to offer their own insights and opinions regarding solutions to urban planning. Furthermore, municipalities can utilize the data and opinions of users fetched from the application to build or rebuild cities more accurately based on people's needs and desires. In this way, the project helps make the city a better place for everyone in a collaborative manner.

In this application, people can directly visualize their ideas in the physical world. Then all the builds submitted can receive votes from other users, which encourages mass participation during the process (Dutch Design Daily, 2020; UrbanAR, 2021a). In a survey carried out by the developers of UrbanAR, users mentioned that the application does not depend on users' subjective imagination because they can already see the elements in the physical world. Furthermore, they stated that this application helps them objectively instantiate their imaginations and ideas and also allows them to see the best arrangement of the urban elements visually (UrbanAR, 2021). Although this application is appropriate for all age groups, it especially provides an opportunity for children to develop their visual literacy and a sense of responsibility toward the city they will be living in for years to come.

Table 1 analyses the examples in terms of opportunities rendered by AR and child-friendly city features. The features of the examples have been categorized based on the children's activity and their interaction with their environment during the game. These features have been extracted from articles and the main web pages of the game developers that are referenced in this article.

As shown in Table 1, children gain various benefits from these AR games. By using AR in Minecraft Earth, children experience playing together in the digital and physical world while developing social skills. At the same time, they communicate with others and enhance their teamworking skills through the game's platform. In EduPARK, children experience multiple modalities of AR content through text, video, and 3D models, which encourages them to use their senses of touch, sight, and hearing in the physical and digital world. With the opportunity that UrbanAR provides, users can express their insights and opinions throughout the urban design process and see their builds instantiate in the physical world. The other possibility that this AR application provides in its platform is that people can comment on each other's work and help improve each other's designs.

In each one of the three examples presented above, some of the child-friendly city features are evident. Children in Minecraft Earth associate with their friends and play with them. The EduPARK app is designed to be explored in an urban green park, a setting that can be used to promote new modes of learning in science education, where experiences in real environments improve one's ability to understand ecosystems (Pombo & Marques, 2020: 2). In turn, children in UrbanAR can experience taking part in designing their city and bringing their imagination to life using digital representations.

5 Conclusion

AR facilitates the development of diverse skills among children. In addition, it develops inquiry-based learning, spatial ability, and practical skills, and it can further create hybrid learning environments that combine digital and physical objects. In this way, AR can promote the growth of skills such as problem-solving, communicating, and critical thinking. As native digitals that are nowadays entertained with technology at home, children can utilize AR to be more present in the city and perform physical activities to develop various skills. Although living in the city has a pure physical form, AR can act as a connector to bring the physical and digital worlds together and help create child-friendly cities.

Based on the literature review and analysis of the examples selected, AR can provide the urban environment with more features of a child-friendly city to inspire children toward a more active presence in the city. As part of future work and as AR is more widely used in urban environments, more feedback needs to be collected from children around the world about their experience using AR in the city to more accurately quantify and compare the role of AR within the child-friendly city.

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Rebuilding post-communist city identity: The case of Novi Pazar, Serbia

In line with contemporary urban policy to build a competitive city identity, this article deals with the post-communist identity of Novi Pazar, a medium-sized city in southwestern Serbia. Research attention is centred on building urban identity through the dynamic interaction between actors and socio-spatial structures. Following Bourdieu's notion of habitus, the concept of a city's habitus is employed as well as Lefebvre's concept of the social production of space. Special focus is placed on the challenges that post-communist cities face in re-establishing their identity following the former promotion of the "communist (industrial) city" and its subsequent decline.

The analysis is based on a survey of residents of Novi Pazar ($n = 299$) and interviews with experts employed in local government and other local institutions/organizations ($n = 14$), as well as content analysis of the city's official website. Novi Pazar is a city with a potentially strong identity but also with considerable structural constraints that block the local agency needed to activate the city's identity potential.

Keywords: identity, post-communist city, habitus, Novi Pazar, Serbia

1　Introduction

Contemporary neoliberal, entrepreneurial, and neoendogenous urban policy demands constant competition among cities based on their local specific features, due to which building urban identity as a development resource has become a strategically significant focus of urban policy (Campelo, 2015). This article focuses on post-communist cities because they encounter particular challenges in rebuilding their identity. This is due to the particular identity legacy of communist cities as industrial cities that neglected specific local resources – especially the traditional or pre-communist city identity – and thus exposed cities to the significant risk of losing their authenticity under communism (Dragićević-Šešić, 2011). Consequently, the turmoil of post-communist transformation further diminishes the ability of local actors to creatively evaluate local resources, rebuild, and diversify their city's identity as a development resource. Relatively little research has been devoted to this topic in the Balkans and in Serbia in particular (Vujošević et al., 2010; Jovanović, 2013; Spasić & Backović, 2017; Petrović & Toković, 2018; Troch & Janssens, 2019; Bogdanović, 2020), except, to a certain extent, for the largest or capital cities (Bursać, 2009; Nedučin et al., 2014; Doytchinov et al., 2015; Arandelovic et al., 2017; Camprag & Suri, 2019; Spasić & Backović, 2020). This article helps fill that void by focusing on Novi Pazar as a medium-sized city in southwestern Serbia.

The article first sketches out the research background, starting with the assumption that dynamic interaction between actors and socio-spatial structures is the basis for creating an urban identity perceived either as a spontaneous long-term process or a strategic activity. Following Bourdieu's notion of habitus, the concept of a city's habitus is employed as well as Lefebvre's concept of the social production of space. The article then highlights some important contextual features of building post-communist cities' identity, in general and in Serbia. The next section is dedicated to an analysis of Novi Pazar's identity based on data collected through interviews and a survey conducted by the University of Belgrade's Institute for Sociological Research in 2013, as well as content analysis of the city's official website conducted between March 2017 and March 2018. The concluding discussion emphasizes the perceived potentials and obstacles for building a competitive identity for Novi Pazar.

2　Research background

2.1　Rebuilding city identity: Spontaneous processes and strategic activity

Building urban identity as a specific development resource is approached by focusing on the interaction between actors and socio-spatial structures. Building city identity is understood as a long-term and complex process in continuous interaction with both objective and subjective changes to the reality on the ground (Lynch, 1960; Norberg-Schulz, 1979; Neill, 2003; Butina-Watson & Bentley, 2007; Houghton & Stevens, 2010; Nas et al., 2011; Kavaratzis et al., 2015). In addition, building the competitive identity of the city (Anholt, 2007) is taken as a strategic activity that also indicates the importance of both (historically developed) material or objective features of the city, and also the meanings, feelings, and expectations that people have about (their) city (Kotler et al., 1999).

Following the idea for connecting the internal development dynamic of a certain territory to the specific code of its local community (Storper, 1997; Moulaert & Sekia, 2003), building urban identity relates to the fact that each city produces a specific mental matrix through constant interaction between the socio-spatial structure of the city and the agency of local actors (Moulaert & Sekia, 2003; Bell & de-Shalit, 2011). Along with such a mental matrix of the city, local actors develop a special view of "the state of affairs" and "how things should be done" (Low, 2012: 321). Each city represents a specific historical and spatial context of particular knowledge and experiences (Spasić & Backović, 2017) or, following Bourdieu's theory, each city has its own habitus (Bourdieu, 1999). The concept of a city habitus in urban sociology is taken as a relatively stable and locally situated pattern of behaviour that gives local actors practical (routine) competence in their immediate environment, in accordance with the specific opportunity structure of key social fields (housing, work, education, culture, and consumption) in a given city (Savage et al., 2005).

Employing the concept of a city habitus in understanding the creation of urban identity both as a spontaneous long-term process and a strategic activity is important in many ways. First, although the world of cities is dynamic and does not necessarily mean the same thing for everyone, the habitus of a city usually generates the same or similar meanings and associations among a large number of people. This is important because sufficiently clear and positive ideas among the local people on what makes their city recognizable and attractive, both to the local population and to potential investors and visitors, is a significant basis for building a competitive city identity (Anholt, 2010). The habitus of the city is also understood as the embodiment

of history, the active present of the entire past whose product it is (Siisiainen, 2000). It functions as accumulated collective memory and influences the ability of local actors to creatively evaluate city resources and strategically build a city identity as a development resource (Campelo, 2015).

As a relational category, identity formation includes comparisons (Jenkins, 1996) – in the case of a city identity, with the opportunity structures of other cities. These external identity relations between "us" and "them", primarily those with the capital city and other levels of government (regional or national), are also mediated by the city's habitus. In Bourdieu's view, social reality spontaneously translates into physical/natural space, and space makes a significant contribution to the naturalization effect of social differences. If the capital city is a place where the highest-quality resources are concentrated, the relationship of the capital to other (peripheral) cities is taken as an essential relationship of inequality (Bourdieu, 1999; Savage et al., 2005). The habitus of a peripheral city reflects the inhibitions of local people's perception in terms of what is possible/impossible or normal/abnormal for "people like us", thus lowering their innovation, initiative, and self-confidence. In other words, the local atmosphere of peripheral cities, marked by passivity and apathy fuelled by the low autonomy of local actors in the face of centralized decision-making models, is taken as an unfavourable characteristic of their habitus regarding the ability of local actors to activate city resources and rebuild the city's identity as a development resource (Campelo, 2015).

Because rebuilding a city's identity in urban policy is strongly influenced by actors that have the power to categorize values (Anholt, 2010), this study also employs Lefebvre's triad concept of the social production of space (Lefebvre, 1991). From this perspective, building a competitive city identity is dominated by the representation of space (strategies, documents, plans, and websites of official institutions), which legitimizes a certain vision of the city that is in accordance with the interests of those in power. This significantly narrows the scope of a spontaneously built city identity, which, in line with Lefebvre's ideas, reflects not only representation of space but also the spatial practices inscribed in the routines of everyday life and the space of representation, a domain for imaginatively challenging the given structures. It means that a strategic redefinition of a city's identity cannot achieve the required authenticity if it does not take into account the spontaneous identity characteristics of the city. Achieving this requires a co-operative approach to city governance, a trusting relationship, participatory principles, and assessment of the attitudes of various local actors whose internal differences (social, economic, political, ethnic, etc.) should not grow to the extent that they prevent consent about the identity (Anholt, 2010; Kavaratzis, 2010). The most frequently mentioned of these actors include

those employed in the city administration and institutions, the local population, local interest groups, entrepreneurs and their associations, and chambers of commerce (Kavaratzis et al., 2015). In practice, however, the local population is often neglected, including a lack of research regarding its behaviour and expectations (Kotler et al., 1999; Insch & Florek, 2008; Bell & de-Shalit, 2011; Brabazon, 2014). The research presented here focuses on the local population's perspective: that of citizens and local experts in Novi Pazar.

2.2 Contextual specifics of post-communist cities

The legacy of communism exposed cities to the significant risk of losing their authenticity due to the idea of a "communist (industrial) city" promoted according to a top-down model (Dragićević-Šešić, 2011). On the other hand, the post-communist period has introduced new challenges, especially for smaller and more peripheral (mainly industrial) cities. They have been facing the very serious consequences of technological decay and are burdened by insufficiently developed or neglected infrastructure, declining skills in the labour force, and an exodus of young people (Jaššo & Finka, 2010; Domanski, 2011; Kiss, 2011). All of this, along with the disappearance of the industrial brands that medium-sized and smaller cities used to be known for, has caused further deterioration of the foundation of their identity as industrial cities. On the other hand, the previously developed habitus of an industrial city often has the effect of limiting local actors when they consider possible developmental options, fuelling collective fatalism and apathy. Moreover, the underdeveloped culture of cooperative governance (Tsenkova & Nedović Budić, 2006; Stanilov, 2007; Ferenčuhová & Gentile, 2016) as another communist legacy nourishes the habitus of a peripheral city and weakens the capacity for redesigning the city's identity.

At the level of representation of space, primacy is given to the legitimization of the city's new economic and political trajectories, with special attention placed on attempts to evoke the economic dynamism of the pre-communist era while presenting the post-communist period as a rebirth of entrepreneurial spirit that had been suspended under communism. This might also be perceived as a reflection of the peripheral habitus in external (international) identity relations, where cities feel burdened by their communist legacy and often try to reject it as a historical aberration, a deviation from the right path, or a historical mistake that should be forgotten (Adler, 2005; Young & Kaczmarek, 2008).

Serbian cities face severe challenges in redefining their identity, most of which they share with other post-communist cities but

that are reinforced by a specific social context. First, due to the prolonged and difficult process of post-communist transformation that took place in the context of wars and the disintegration of Yugoslavia, the slowness of economic restructuring and attracting new (direct foreign) investment has caused a severe decline in industrial output and the collapse of many industrial (or mono-industrial) cities (Vujošević et al., 2010). Second, the developmental disparity between Belgrade, as the capital, and other cities has been increasing significantly (Molnar, 2013), due to which most Serbian cities have become or remained peripheral (Stojković, 2009). Third, within Serbia's highly centralized decision-making model, local authorities are typified by incompetent local administration and underdeveloped communication between the public, private, and civil sectors (Vujović & Petrović, 2007; Vujošević et al., 2010; Petrović & Toković, 2016, 2018).

Novi Pazar reflects most of the aforementioned challenges in terms of redefining the identity of post-communist cities, as well as those arising from the specific context of Serbian society. Although Novi Pazar is categorized as a functional urban area of national importance (Šećerov & Nevenić, 2009), its opportunity structure is rather unfavourable. Namely, the city has remained cut off from the main national and international road corridors since the establishment of new national borders. Furthermore, Novi Pazar faces significant economic problems and, with a level of development that is between 60 and 80% of the national average, it is among the underdeveloped local governments in Serbia (Regionalni razvoj, 2014), marked by considerable economic (industrial) decline in the post-communist period. Moreover, it is one of the few cities in Serbia with positive population growth, which demands constant increases to infrastructure investment in the city. Today, Novi Pazar is a city with a significant concentration of Bosniaks within Serbia in spite of its significant economic problems and insufficient infrastructure. In accordance with the rather restrictive opportunity structure of Novi Pazar, it is presumed that the city habitus has inhibiting effects on local actors' perception of its identity – this particularly applies to its industrial habitus due to the city's economic (industrial) decline and its peripheral habitus in external identity relations (toward the capital city and other cities in Serbia) due to spatial marginalization and a centralized governance model.

3   Method and analytical aims

For insight into (re)building Novi Pazar's identity, two perspectives were included: one related to spontaneous long-term processes, and the other related to strategic urban policy endeavours. Data were collected via a survey with inhabitants of Novi Pazar ($n = 299$) and through interviews with experts ($n = 14$) employed in local government departments (primarily in economics, culture, and social services), at key local institutions (such as the chamber of commerce and cultural institutions), and in non-governmental organizations that cooperated with local government on developing city projects. Although the perspective of both actors is more or less spontaneously generated under the influence of the city's habitus, the experts' perception also includes strategic conceptualization (or representation) of the city's identity. In addition, the representation of space is analysed through content analysis of Novi Pazar's official website.

Bearing in mind that the identity of a city is stronger if its habitus invokes the same or similar positive meaning among the local people, the first analytical aim is to obtain insight into the various features of Novi Pazar's identity through respondents' perceptions of distinctive markers and city symbols – including how others in Serbia perceive the city. This involves checking the possible negative impact of an unfavourable opportunity structure in Novi Pazar on respondents' perception of and differences from shared views, depending on their ethnic background, age, education, and other sociodemographic characteristics. The analysis then focuses on designing a competitive identity for Novi Pazar while bearing in mind the impact that the city's habitus has on local people's perceptions of the general state of affairs and how things should be done in their city. Here the goal is to determine the extent to which the habitus of an industrial city and the habitus of a peripheral city impede building Novi Pazar's identity. Finally, the study turns to content analysis of Novi Pazar's official website to explore whether the city identity markers represented correspond to those expressed by the respondents, taking this as a kind of a precondition to achieve the required authenticity of the city identity. For the same purpose, the level of communication is assessed between the website creators and the public, including internal (local residents) and external (tourists and investors).

3.1   Spontaneous consensus on key identity markers

This section analyses Novi Pazar's identity through respondents' perceptions of distinctive markers and city symbols, including how others in Serbia perceive the city. The goal is to assess whether the habitus of Novi Pazar invokes positive associations and the same or a similar meaning among the local people, which is taken as a potential for building a strong city identity. The analysis is drawn from the same questions in the survey and interviews. The key identity markers of the city are operationalized through the following dimensions: 1) recognizable markers of the city, 2) city symbols, 3) characteristics of the city residents, and 4) perception of the city by external
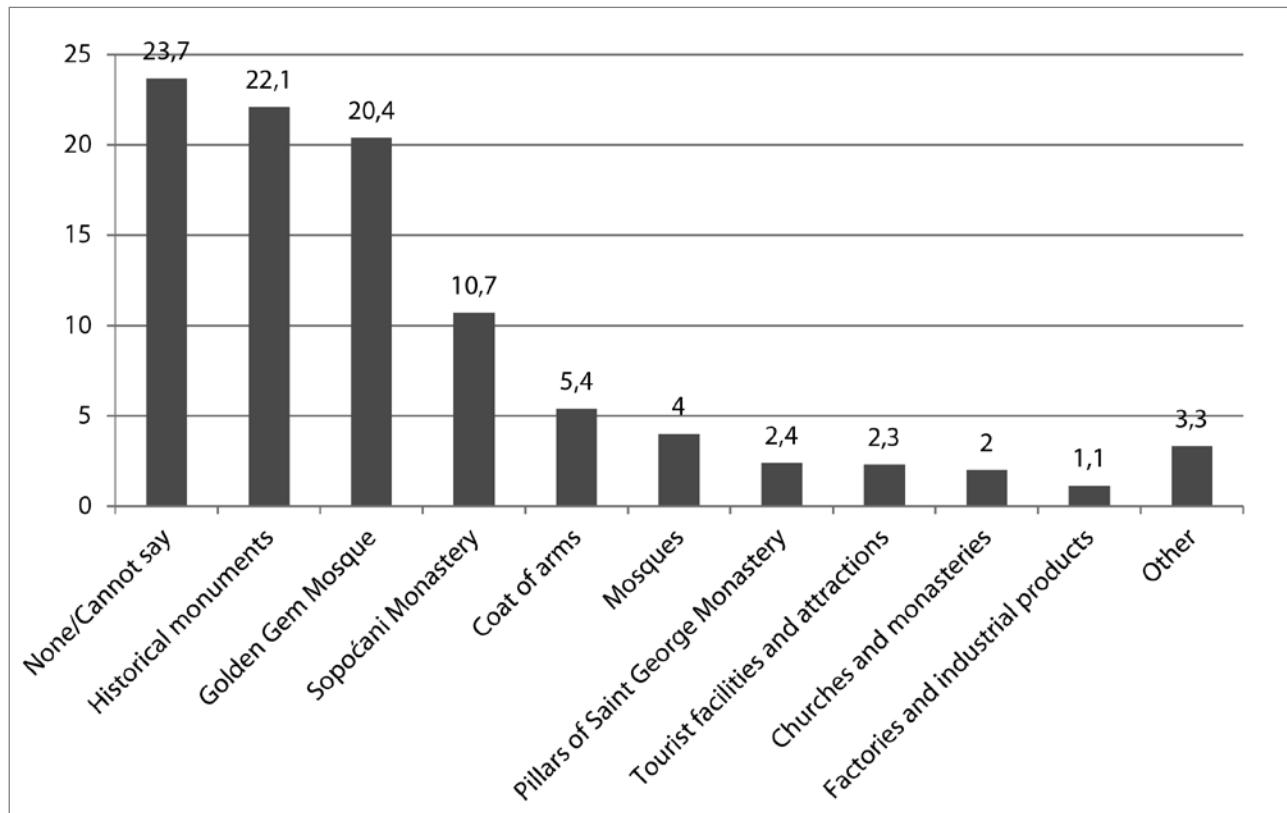
Figure 1: City symbols (illustration: authors).

Figure 2: The Golden Gem Mosque (source: Mathematical Institute of the Serbian Academy of Science and Arts, 2022).

Figure 3: The Sopoćani Monastery (photo: Irena Petrović).

actors. The questions related to these dimensions in the survey were open-ended. The answers obtained were first coded, and then further data processing was performed in the SPSS statistical program, relying on descriptive statistical analysis. The same principle for coding the responses was applied to the interview transcripts. The qualitative data were processed with the Maxqda program. After separate analyses of quantitative and qualitative data, an analysis of matching (i.e., noting the differences between the citizens surveyed and the actors interviewed) was performed to examine the level of consistency in their perception of Novi Pazar's identity.

Because Novi Pazar is a city with a rich history dating back to the medieval Serbian state and the Ottoman Empire, its multi-ethnic and multi-confessional heritage is significant for both Serbs and Bosniaks in terms of identity. Therefore, it is no surprise that both the survey respondents and interviewees predominantly mentioned cultural and historical monuments as markers and/or symbols of their city. In the survey, 40% of the selected symbols were religious monuments, whereas secular structures were mentioned in 22% of the answers. Analysis of the interviews points to a consensus around the selected symbols, in terms of both selecting the type of monuments and specifying particular structures: "I definitely believe that the Fortress (SCr. *Bedem*) is a symbol of the city, the Fortress along with the Watchtower (*Kula Motrilja*)" (interviewee 7); "We have mosques such as the Golden Gem Mosque (*Altunalem džamija*), then Saint Peter's Church (*Crkva Svetog Petra*), the Sopoćani and Pillars of Saint George (*Đurđevi Stupovi*) monasteries; all these are symbols that in some way characterize this city" (interviewee 11).

The remaining answers regarding the city identity markers or symbols include traditional food and drink – predominantly rolled kebabs (SCr. *ćevapi*) and baked dumplings (*mantije*), 17.0% – factories and products (mainly jeans, 14.2%), and characteristic business activities (predominantly trade, 10.6%), thus moving the focus from material to behavioural symbolism (Nas et al., 2011; Spasić & Backović, 2017). Such behavioural symbolism became particularly noticeable in answers to questions about the specific traits of people from Novi Pazar, where as many as 38% of respondents cited hospitality. In the interviews, such traits were also pointed out and described as aspects of relationships between people indicating rather harmonizing effects of the city habitus and the predominance of positive identity associations: "The relationships among people in Novi Pazar are specific, somehow, they are straightforward with each other and there is a warm-hearted atmosphere" (NP4).

The same might be concluded regarding the material symbolism of the selected markers and symbols through which respondents indirectly emphasized the centuries of the coexistence of two religious and ethnic groups in the city, although fewer than 1% of the respondents mentioned the "mixed population" as something that Novi Pazar is known for. In the interviews, the multiculturalism of Novi Pazar was explicitly emphasized as an important aspect of the city's identity: "This multicultural community is very specific, with monuments of the two completely different cultures, all in one place" (NP7).

Prevailing positive identity associations, such as hospitality or a commercial spirit, and the multi-ethnic character of the city, are consensually related to the historically based habitus of a trade-oriented city and its impact on shaping the entrepre-

neurial skills of the local population. These qualities are also seen as crucial for overcoming potential internal conflicts, even during the war years of the 1990s:

You know, we the people of Novi Pazar, no matter how extreme and silly we may seem to be, when tough times arrive, whether it's better to wage war or trade, it's always better to trade, and that's because we are traders. Novi Pazar is a multi-ethnic city and, now let's not pretend, relations between Serbs and Bosniaks are not ideal, but we are proud of the fact that in the worst times, during the nineties and the war in Bosnia, that war did not affect us over here because we succeeded (as this was the desire of both sides) in not having any conflict here. The city managed to preserve itself. (NP9)

Therefore, it appeared that the unfavourable opportunity structure of Novi Pazar does not significantly affect the respondents' perception of the city's identity. The only negative connotation was related to the fact that Novi Pazar is demographically among the youngest cities in Serbia. In general, those surveyed very rarely (only 2.3% of them) stated that the city is known for being a city of "young people", whereas in the interviews this was stressed as both a positive feature of the city, but also as a problem: "I see this as the biggest and most overwhelming obstacle, because you have a huge number of young people . . . and then every year you get a thousand new unemployed people, so the fact that Pazar is a young city is a significant thing, but at the same time it makes things difficult" (NP6).

Examination of the impact of sex, age, education, occupation, financial status, and ethnic background does not show any extreme division or conflict in how the analysed aspects of Novi Pazar's identity are understood. Thus, it appears that, in spite of ethnic, cultural, and other social differences, the habitus of Novi Pazar generates similar meanings and associations among local people about their city. The findings also suggest that respondents have a sufficiently clear idea of what makes Novi Pazar recognizable and attractive, which might be a good foundation for building its competitive identity. However, the responses regarding perceptions of how others see Novi Pazar show that over a third of the respondents believe that others have a predominantly negative perception of their city. This indicates the impact of a peripheral habitus on perceiving city identity from the perspective of external relations (through comparison with other cities in Serbia).

3.2 Obstacles to strategic rebuilding of the city's identity

This section focuses on questions indicating whether the habitus of an industrial city and a peripheral city have impeding
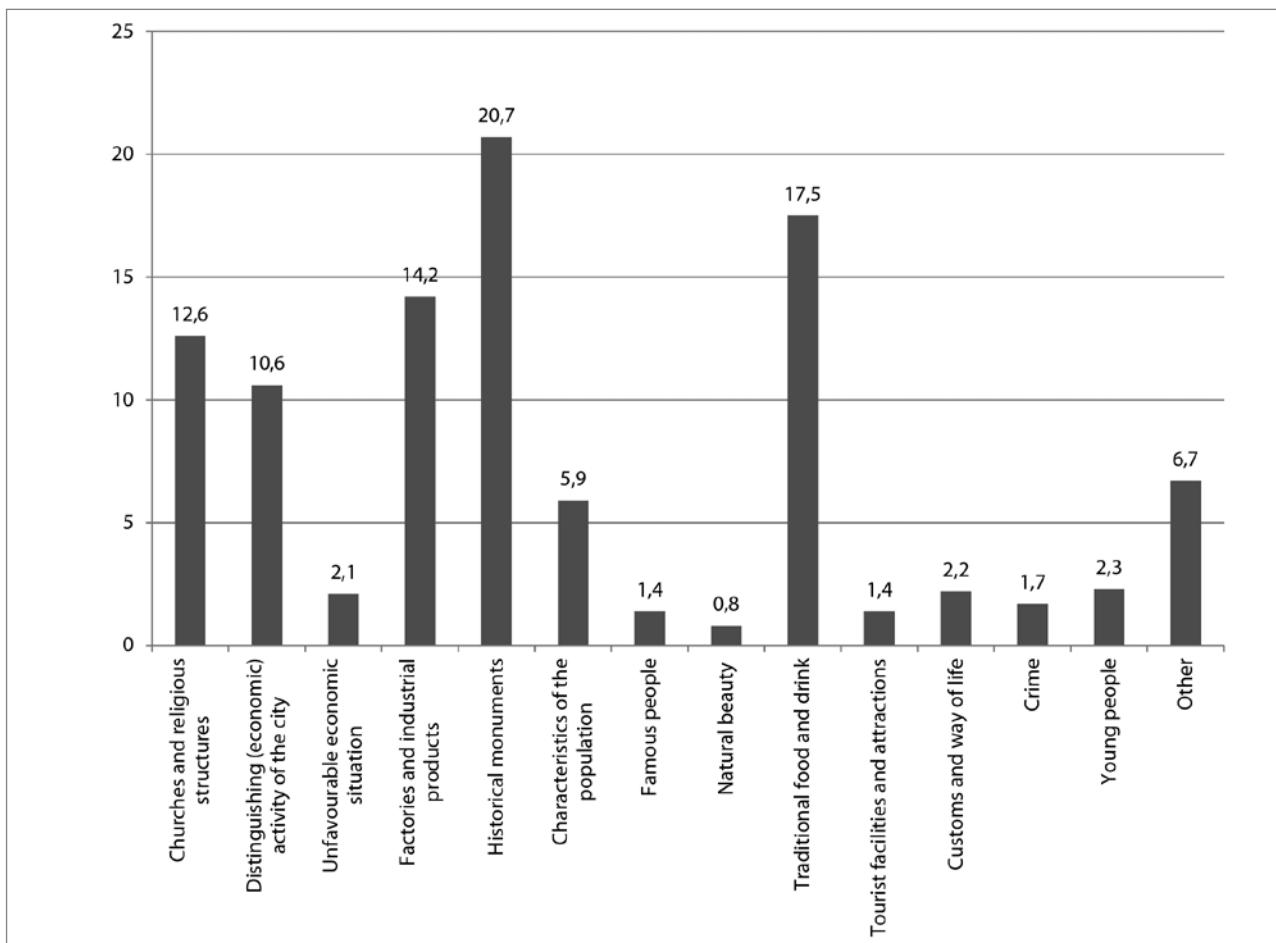
Figure 4: City recognizability factors (illustration: authors).
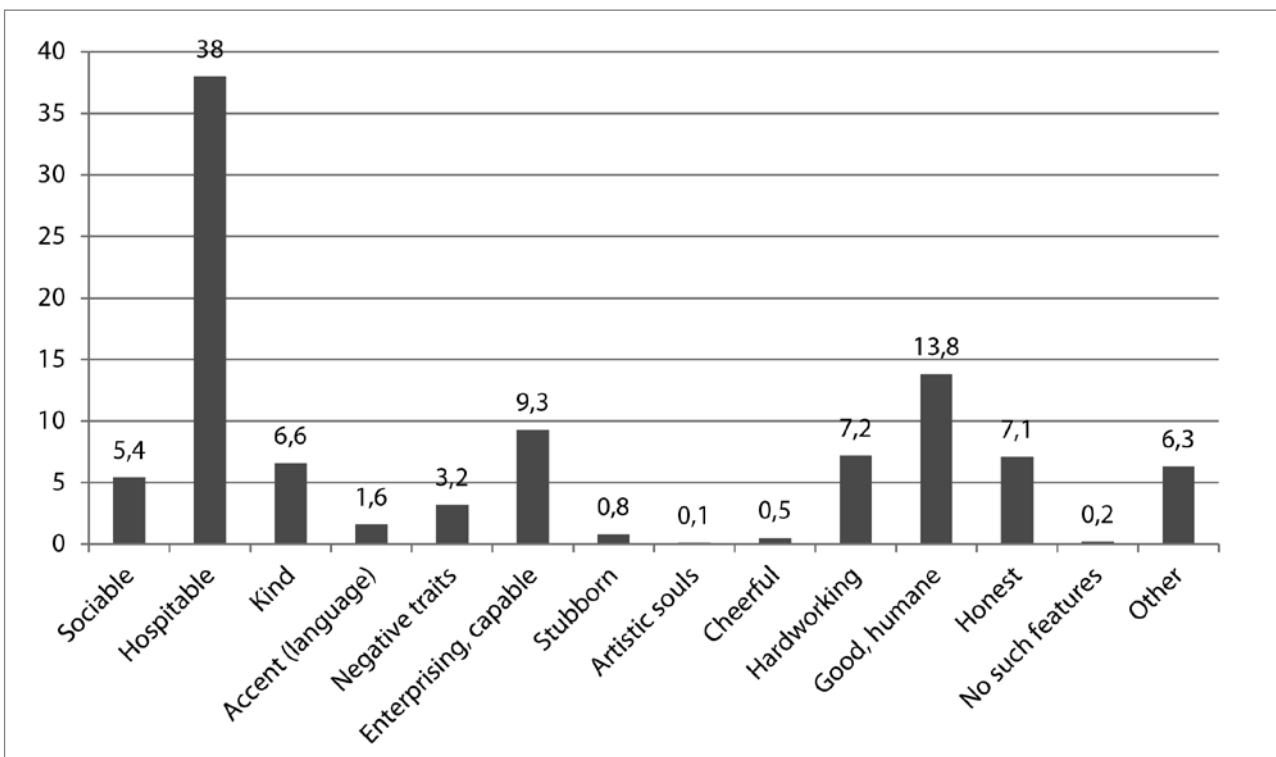
Figure 5: Characteristics of the city residents (illustration: authors)

Table 1: What image of your city do people that live in other parts of Serbia have?

Image	Percentage
Mostly positive	32.1
Mostly negative	36.3
Neither positive nor negative	19.0
I do not know.	12.6
Total	100.0

Source: authors.

effects on building a competitive city identity for Novi Pazar. These questions were related to local people's perceptions of the state of affairs in Novi Pazar in general and in comparison to other cities, and how things should be done in their city, including respondents' ideas of the city's development potential and the key obstacles to its achievement. Thus, these questions were focused more on rebuilding competitive city identity as strategic activity and were asked only during the interviews. The competitive city identity was operationalized through the following dimensions: 1) development potentials of the city, 2) internal obstacles to city development, 3) external obstacles to city development, 4) structural obstacles to city development, and 5) actors' obstacles to city development. Qualitative data were coded in the Maxqda program, according to the dimensions outlined.

In line with the entrepreneurialism of the local people as one of identity markers of the city, which was already emphasized, local entrepreneurialism is almost unanimously perceived as the key development potential of Novi Pazar. In the respondents' view, despite the fact that industrial development was forced onto the city under communism, the industrial habitus has not only weakened but was not even established in Novi Pazar. Therefore, the respondents expressed no sense of loss in this regard, and they did not place much importance on any product that would make their city stand out as an industrial city, but saw the small grocery shop (SCr. *dućan*) as a symbol of the city: "Its name [Novi Pazar] means 'merchant city', and there is no special product to reflect its identity. Then, during communism, large companies were opened. We never had a tradition in it. The tradition was that it was a trade-oriented city. The symbol of this city is a small grocery shop, because that's where we started from and where a large number of people earn their living" (NP2).

The fact that respondents link local entrepreneurism primarily to psychological features, describing it as a deeply rooted mental code of the local community and do not relate it to capitalism (as opposed to communism), seems to feed their self-confidence: "We have a saying that Novi Pazar is located 'on some special waters' in that sense. Meaning that there is no crisis that we are not able to overcome, in any sense" (NP10).

However, the restrictive opportunity structure of Novi Pazar is reflected in respondents' strong feeling of economic decline in comparison to other cities of similar size in Serbia, as well as of territorial marginalization with newly defined borders that have changed the importance of road routes to Montenegro and Kosovo, particularly because this contrasts with the historically established identity of Novi Pazar as a trade-oriented city: "In general, if we look at, for example, the economic aspect, we are in a tough situation, much harder than everybody else" (NP12). "Novi Pazar is the centre of the Sandžak region of Serbia, but it is a 'black hole' compared to the other regions, and that is a shame" (NP4). "Compared to other cities of a similar size . . . not a single state-owned company has survived, so that at least people can stay employed" (NP7). "A commercial city blocked by borders in this new age" (NP2).

Although the respondents do not indicate apathy or a lack of enthusiasm as typical markers of a peripheral city habitus, the expressed feelings of economic and territorial marginalization speak in favour of it. Thus, some respondents fear that Novi Pazar is becoming a city known for low-wage labour, an illegal economy, and underdevelopment: "Novi Pazar is very poor . . . a lot of money is taken at the expense of the city's income, and therefore some other things cannot be done; all that you see is the informal economy" (NP11).

The features of a peripheral city habitus become even more noticeable when respondents explicitly speak about how the centralized model of governance and the concentration of power and valuable resources in the capital city foster a lack of interest among local politicians and representatives at the national level to support their own cities. The respondents spoke about the lack of initiative and self-confidence among local actors, lack of trust and enthusiasm between local politicians and experts, limited decision-making autonomy of experts due to the imposed supremacy of loyalty to a political party over expert knowledge, lack of participative practices in local governance, and so on: "Now, Rasim's [Rasim Ljajić, a local politician with a career at the national level] political party has a greater role, and he shows little interest . . . he moved away and Novi Pazar is not interesting to him anymore, he's only interested in Belgrade" (NP6). "Political party affiliation is the priority, while competence doesn't matter at all" (NP1). "Here you neither have the cooperation of local government with the university, nor the university with the local economy, nor of local government with the non-governmental sector" (NP8). "The crisis is never due to a lack of money, but a lack of trust or, rather, a lack of enthusiasm" (NP4).

3.3 Representation of city identity on the official website

This section analyses the content of Novi Pazar's official website (Grad Novi Pazar, 2017) as a specific representation of space in the service of building a competitive city identity. In general, official websites pay particular attention to cultural and historical heritage as the most important aspects of a city's identity (Morgan et al., 2004; Dragićević Šešić, 2009), and monuments and architectural heritage are among the most recognizable markers and symbols. In Lynch's terminology, Novi Pazar could be described as an "imaginable" city because it is easily visualized through what can be seen thanks to its numerous monuments and architectural legacy of profound historical and cultural significance (Spasić & Backović, 2017). Visual identity as an analytical category was constructed to determine whether architectural heritage and monuments are recognized as significant symbols of the city on Novi Pazar's website and to explore the level of consistency between the website content and respondents' attitudes in that respect In addition, the analytical category of processing local history was constructed to detect how the historical stages of the city's development are presented It is assumed that, if they are presented in a continual manner, this contributes more to the preservation of collective memory and does not reflect the peripheral habitus of the city than if they are presented discontinuously and the communist period is neglected.

Analysis of the Novi Pazar website showed that the potential of cultural and historical heritage remained insufficiently exploited and that the website failed to display a strong visual identity for the city. The Fortress of Novi Pazar is recognized as the dominant symbol of the city, but there are no photographs on the highest-priority pages. Places of worship were not presented as symbols, even though photographs of churches and monasteries as well as mosques prevail throughout the website, implying that multiculturalism stands out as a characteristic of Novi Pazar. However, these photographs are also not presented on the highest-priority pages, and there are no special sections or videos dedicated to the cultural and historical heritage of the city. It could be concluded that the way in which the key identity markers and symbols are represented on the website correspond to respondents' perception, including their opinion that the promotion of the monuments and architectural legacy of Novi Pazar has been neglected: "Our tourist organization and we as the city don't even have a single postcard" (NP14).

The historical memory of the city starts with the first mention of its name, *Yeni Bazar* 'new bazaar', in a written document from 1461, and the description of the city's history ends with the last decades of the nineteenth century, when, according to the creator of the website, the city lost its former political and economic role (Grad Novi Pazar, 2013). There is certainly a discontinuity in the processing of local history, but it also confirms the long-held identity of Novi Pazar as a multicultural trade-oriented city (Opština Novi Pazar, 2017). Despite the fact that any reflection on the twentieth century or even the city's communist past remains invisible, the website creators do emphasize several identity features of Novi Pazar as a contemporary city: a university city, a city of entrepreneurs, a city of youth, a city of opportunity, a city of jeans, and a European city (Gradska uprava Novi Pazar, 2016). This is consistent with the findings of studying the websites of other post-communist cities that point to discontinuity with the communist past or its fragmentary display (Adler, 2005) and to the modern, capitalist, European city as the dominant discourse in promoting the city. Neglect of the communist past suggests that Novi Pazar shares a kind of peripheral habitus typical of post-communist cities regarding their external identity relations; that is, in comparison with other cities at the European level.

Finally, the communication features of the website are explored as an indication of how interactive local government is with both internal audiences (i.e., residents) and external audiences (i.e., tourists, potential developers, etc.) to allow a participative approach in designing the city's image (Varbanova, 2007; Florek, 2011). The Novi Pazar website is alternatively written in Latin and Cyrillic script in accordance with its internal multicultural image, but its content has not been entirely translated into English, which indicates that the external audiences are not sufficiently and consistently addressed. The interactive website matrix relates only to utility services, and navigation to social media has been completely omitted, even though this is now the most suitable interactive platform. All the findings above indicate that, despite the interactive potentials that the website provides for a more participatory definition of competitive city identity, these have remained almost entirely unutilized.

4 Discussion

The first analytical aim was to show how respondents perceive the identity markers and symbols of Novi Pazar, bearing in mind the city's unfavourable opportunity structure and the hypothesis that the city identity is stronger if its habitus invokes

the same or a similar positive meaning among the local people. The results indicate that Novi Pazar is potentially a city with a strong identity. Namely, it appears that Novi Pazar's habitus predominantly generates positive associations among the respondents without major discrepancies in attitudes among different social groups (by education, age, or ethnicity). The most frequently mentioned city markers and symbols primarily cover cultural heritage, particularly monuments and the architectural legacy of Novi Pazar's multi-ethnic and multi-confessional history. In addition, a commercial (entrepreneurial) mentality and corresponding hospitality, as well as inter-ethnic and cultural tolerance, are particularly noticeable in answers to questions about the specific traits of local people. However, such affirmative self-perception of the respondents about their city contrasts with their perception that others in Serbia have a rather negative image of Novi Pazar. This indicates the impact of the peripheral habitus on respondents' perception regarding external identity relations (through comparison with other cities in Serbia), which appears more visible in answers related to the key obstacles to achieving a competitive city identity for Novi Pazar.

The second analytical aim was to examine whether the habitus of an industrial communist city, perceived as the embodiment of the city's recent history, and the habitus of a peripheral city, taken as possibly inhibiting local people's action capacities, impede the building of a competitive city identity for Novi Pazar. This proved to be a rather complex research issue because, on the one hand, the respondents strongly emphasize local entrepreneurialism as a key city identity marker and development potential, which does not indicate a lack of enthusiasm and apathy among the local population, which is typical of the habitus of a peripheral city. In addition, according to the respondents, the deeply embedded habitus of a trade-oriented city based on local entrepreneurialism diminishes the identity crisis that Novi Pazar could face in the post-communist period due to the impact of the habitus of an industrial communist city. In fact, the respondents claim that an industrial identity was never established in Novi Pazar, even under communism. On the other hand, the respondents point to the low autonomy and integrity of local actors typical for a peripheral city habitus caused by the governance mode dominated by political parties and centralized state power in the post-communist period. This, as the respondents emphasize, mainly pushes local entrepreneurialism to the margins, into the informal economy, which in their view decreases the city's external reputation and contributes to underdevelopment and peripheral features of Novi Pazar as well as to its territorial marginalization due to new borders after the demise of Yugoslavia. Based on the image of Novi Pazar primarily as a trade-oriented city in the past, present, and future, respondents expect to overcome its current peripheral position with the anticipated entry of Serbia into

the European Union: "To open the borders and to make Novi Pazar the trading centre of a modern region of Serbia and the European Union" (NP4). It seems, however, that respondents underestimate the possible impeding effects of the peripheral city habitus with the appearance of post-communist cities on the European scene, as the experience of other cities has shown.

The third analytical aim was to explore whether the city identity symbols on Novi Pazar's official website correspond to those expressed in the survey. It was hypothesized that such correspondence is a precondition to achieve the required authenticity in the production of the city identity. Although this research confirms the needed consistency between the website content and attitudes expressed by the respondents and interviewees, the interactive website potentials remain almost entirely unutilized for a more participative definition of city identity through communication between the website creators and the public. Moreover, there is a lack of continuity in presenting the centuries-old history of Novi Pazar as a reflection of the post-communist city's peripheral habitus in external (international) identity relations. The fact that the recent history of Novi Pazar, including the communist period, has been neglected on the website might be in line with intention of other post-communist cities to reject their communist legacy, although the respondents in Novi Pazar did not have negative connotations regarding the communist past, possibly due to the more liberal character of communism in the former Yugoslavia (Lazić, 2011). Moreover, in contrast to the post-communist cities of central Europe, which emphasize their economic vitality and entrepreneurship from the immediate pre-communist time, both the website presentation and the respondents place no noticeable emphasis on pre-communist Novi Pazar in the late nineteenth or early twentieth century. This might also be related to the fact that the respondents primarily perceive local entrepreneurism as a mental code deeply embedded in the historically long tradition of Novi Pazar as a trade-oriented city, without linking it to capitalism. Finally, it is possible that the website creators wanted to avoid internal or external disagreements in the interpretation of recent history, thus alleviating the problems of redefining the city's identity in a post-communist Serbia burdened by ethnic tensions.

5 Conclusion

This explorative study sought to gain nuanced insight into whether the building of a competitive city identity has a sufficient foothold in a medium-sized city facing development problems. In the case of Novi Pazar, the respondents' agreement about the city's key identity markers and their strong enthusiasm regarding local entrepreneurship and multiculturalism indicate the city's potential for building a competitive identity. However, at the same time, the respondents' feelings

of economic, political, and territorial marginalization indicate the obstacles stemming from its peripheral habitus. To summarize the key research findings in line with the neoendogenous urban policy inputs, which seek to build the identity of a particular city as a development resource and postulate that the best development effects are achieved through a synergy of exogenous and endogenous development factors (Vanclay, 2011), one might ask what programs should be supported by external development funds (national or supranational) in the case of Novi Pazar. The authors feel that programs aimed at ensuring the synergy of endogenous and exogenous development factors should primarily aim to empower local entrepreneurism, which is now facing considerable structural constraints. This would help unblock the local agency needed to activate the local potential for (re)creating both the opportunity structure and competitive identity of Novi Pazar.

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Comparing residents' perceptions of quality of life in three Kyiv neighbourhoods

According to Global North urban studies, the traditional low-rise mixed-function perimeter block is the most attractive urban morphology in terms of organization of space, time, values, and social interactions. This study examines how valid these basic theses are regarding the comfort of urban housing morphological types in Kyiv, the capital of Ukraine. We compare residents' quality of life and analyse the differences in residents' behavioural patterns and spatial perception in different morphological types of housing to identify distinguishing features of the most comfortable urban form. Using expert evaluation and surveys, we assess history; jobs; social, educational, and cultural services; environmental indicators; security levels; and public activity in three differ-ent neighbourhoods: Zhulyany (with detached houses), Podil (with low-rise perimeter blocks), and Rusanivka (with Soviet high-rises). The results reveal that the Soviet neighbourhood, Rusanivka, leads in terms of both objective indicators and residents' perception as the most comfortable living area. This finding contradicts generally accepted theories about exemplary and attractive urban morphology. This preference is based on the planning and construction priorities of the unique social system of Rusanivka, where its human-centeredness and a thoughtful integrated approach are highly valued.

Keywords: urban morphology, neighbourhoods, quality of life, perceptions, Kyiv

1   Introduction

One of the main reasons to study the quality of residents' life in different urban environments is to explore positive changes that improve people's living conditions. This desire can be achieved through appropriate urban management, planning, and design. A natural question about which form of urban housing is the best for residents arises when making management decisions in post-communist cities, where the urban environments formed under communist regimes are now being adapted and remodelled to new conditions shaped by the political, economic, and cultural transition to capitalist society (Sýkora, 2009). This question is very important in studying Kyiv, the capital of Ukraine, where neighbourhoods with historical perimeter blocks, detached houses, and Soviet-era high-rises are physically combined in areas that are now actively and chaotically superimposed on the compacted complexes of the neoliberal post-Soviet era (Dronova & Brunn, 2018). To answer this question directly, it is important to identify the key features of different urban morphologies in the context of residents' quality of life. It is also important to understand how satisfied the residents are with their living conditions, what concerns them, and how their living environment shapes their behaviour, perception, and activity in the community. These issues are extremely timely when addressing the need to rebuild Ukrainian cities destroyed by Russian aggression in 2022. These paths toward restoration require in-depth investigation.

A number of urban morphology studies explore cities as human habitats with an emphasis on urban forms (Moudon, 1997; Gauthier & Gilliland, 2006; Standard, 2019). According to Kevin Lynch (1984), a pioneer in studying human habitats, urban form is "complex and mysterious as a system of human values", which emphasizes the relevance of the cognitive approach and attention to the image of the urban environment in human perception (Jang & Kim, 2019). Thus, what is important and interesting are the interconnections in the related processes; that is, how people develop space and how urban forms affect people's lives. The most optimal spatial development for residents' comfortable existence in an urban environment has been explored in previous urban studies. In terms of the organization of space, time, values, and social interactions, the most attractive urban morphological type is a neighbourhood with traditional low-rise mixed-function perimeter blocks with an active street front, a high level of security, necessary services and social amenities, and the availability of shops and an active nightlife (Alexander, 1977; Gehl, 2013; Rapoport, 2016; Talen, 2019). Neighbourhoods with detached houses are not considered as comfortable due to a lack of amenities and social activities. Neighbourhoods with Soviet high-rises are also not
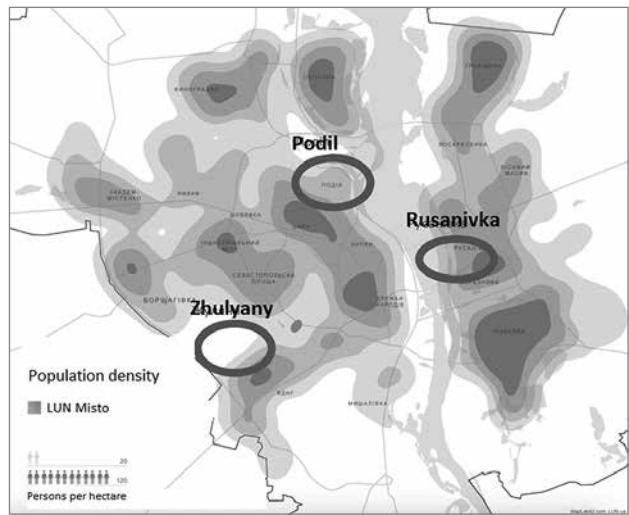
Figure 1: Kyiv population density map with the location of the three neighbourhoods (illustration: adapted from LUN misto, 2019).

considered comfortable enough due to scattered spaces and the isolation of the upper floors from any active social life.

In this study based on Kyiv, we examine how valid these basic theses are regarding the comfort of urban forms of residential areas for a city in post-communist space. It also identifies the perception and mental images or preferences of Kyiv residents for certain types of neighbourhoods that have emerged as a result of historical, socioeconomic, and political conditions in urban development (Conzen, 1960). Three neighbourhoods in Kyiv were selected for this study (Figure 1). They represent different morphological types of housing: Zhulyany (a neighbourhood with detached houses), Podil (a neighbourhood with low-rise perimeter blocks), and Rusanivka (a neighbourhood with Soviet high-rises). In each neighbourhood, residents' perceptions of their living conditions, involvement in community life, interactions with surrounding spaces, and security level are studied through online questionnaires and in-depth interviews.

The major objectives are to a) compare residents' quality of life in the three neighbourhoods, b) analyse the differences in behavioural patterns and mental maps in different urban housing morphologies, and c) identify features of the most comfortable urban morphological type of residential areas. Within the context of different historical formation conditions, we compare the quality of residents' lives in the neighbourhoods in terms of comfort, diversity, and functionality. In particular, we assess the availability of jobs, social services, and educational and cultural facilities, as well as air pollution, noise, availability of green areas and other open public spaces, and the level of security and activity within the community.

2   Theoretical background

To study different varieties of the urban environment, it is desirable to use homogeneous typological units. We use the concept of urban morphologies to refer to the complex set of various properties of physical structures and urban space (Sarjala et al., 2016). They relate to the historical and cultural context of property development, construction planning, functional purpose, and diversity. Urban morphology in general relates to the physical form of settlements. It is tied to the formation of urban fabric components and the relationship of these components, which describe their compositions and configurations through time (Chiaradia, 2019). Urban form refers to the main physical elements that structure and shape the city, including streets, squares (public space), blocks, lots, and buildings, to name the most important (Oliveira, 2016). Urban morphological types are generalized models that define strong socio-spatial complexes (Krasheninnikov, 2019). They are associated with social, economic, or political urban processes and are often used in urban design because they form a link between abstract ideas and real forms (Moudon, 1994). Certain features of human behaviour depend on the spatial surroundings, and repetitive patterns of behaviour change that space, suggesting that different internal variables will lead to different morphological types of the urban environment. These "ground" or space variables are also important to consider in exploring the behavioural and perceptual properties of an environment based on the people living there.

In the 1960s in the United States, Lynch (1960) was one of the first scholars to study the perception and mental images of the city. In his thinking, the technocratic modernist approach to urban development planning ignored the spatial-temporal complexity and dynamism of urban organisms and led to the anti-humanization of the city. Even in the 1960s, the opinion that modernist functional planning produced "inhumane" and "uninhabited" areas was widely supported in the research and administrative communities of the Global North (Jacobs, 1961; Fyfe, 1996). Beginning in the 1970s, the ideas of anti-functionalism were supported by Soviet architects and city planners, and later by urbanists. Glazychev (2008) writes that the dream of the twentieth-century modernists came true and existed in the Soviet Union. However, it also created more problems than successful solutions. The city of towers proposed by Le Corbusier and randomly placed within green space destroyed the traditional system of courtyards and neighbourhoods, and it created an empty undivided space (Jacobs, 2006).

Other authors also joined the discussion. Gutnov (1984), for example, noted that the ideas of communism, combined with the principles of "orthodox functionalism", also played a positive role at a certain period of time in solving social problems after the Second World War. On the other hand, he added that free planning contributed to the loss of quality of the living environment: "Large, amorphous inner quarter territories of neighbourhoods belong to all buildings and, at the same time, as a result, such spaces often remain undeveloped." The courtyard itself became open to outsiders and traffic. Alexander (1977) paid considerable attention to both an understanding of the comfortable urban morphological types that combine many functions and the perception of space by a particular individual. Paying attention to optimal building height and proposing the rules of "sandwich height", he noted that the modernist building row type of construction is uncomfortable because the buildings shade the street and make space monotonous. In his opinion, it is optimal to arrange houses in groups, alternating height and architectural solutions. Gehl (2013) continues Alexander's opinion by relying not only on the social aspects of specific morphological types but also delving into the biological mechanisms of human worldviews. He emphasizes that planning for the future should shift the focus of attention from building to human life. "Human life – space – building" is exactly the sequence in which the requirements for a comfortable urban environment are formed. The rejection of functional zoning, which leads to disconnection between urban space and citizens and to urban sprawl, has also long been supported by the advocates of new urbanism (Garde, 2020).

Whereas in the Global North the modernist principles in urban planning were initiated by architects, in the Soviet Union the impulse for their mass implementation was political (Dronova & Maruniak, 2019). The Soviet era to some extent left its mark on every city in Ukraine by creating a new cultural layer and a special architectural urban form of large-scale multistorey construction, which left a deep impression in the minds of urban residents. Unlike western Europe, where the loss of government support for modernist housing developments doomed them to decline (Le Normand, 2014), the many high-rise neighbourhoods in Ukraine were integrated into the city structure and are still treated as a satisfactory place to live. All this is happening against the general background of low-quality housing in Ukraine. Thus, even though the residents of such areas often experience alienation from their living space due to various economic, social, and other factors, this does not result in them changing their place of residence (Mysak, 2014).

Soviet approaches to urban planning viewed neighbourhoods as elements of the material and spatial environment of everyday human activity, not as multifunctional spaces. After the collapse of the communist bloc, cities faced new challenges: rethinking past planning decisions and finding new ones. Post-communist cities today are seen as a separate element in the network of European cities. Neoliberalism is widely recognized as the dominant ideology in former Soviet bloc countries (Stenning et al., 2010). Golubchikov et al. (2014) comment on post-communist urban development through the concept of hybrid spaces emerging from the mutual embodiment of neoliberalism and communist heritage. The communist legacy has been alienated from its history and has become the infrastructure of neoliberalization. Due to morphology, land use, and social segregation, some typical capitalist urban areas can be identified in these cities, whereas other areas of urban landscapes resemble frozen mirrors of communism (Sýkora & Bouzarovski, 2012).

Studies related to the quality of life in post-communist cities as a complex theoretical concept identify links between different areas of public planning, private life, and human perceptions (Massam, 2002). A number of recent studies consider improving the quality of life a potential key and describe the outcome of this in relation to public planning (Murgaš & Klobučník, 2016; Merschdorf et al., 2020; Faka, 2020). Researchers associate quality of life with satisfaction in life, which is very often understood and considered within the context of the quality of a place (Dehimi, 2021). Research on quality of life encompasses many dimensions, including economic, social, cultural, environmental, demography, inclusiveness, security, involvement of the local population, and the human perception of the built environment. Such research focuses on both objective reality and subjective perceptions (Marans, 2001).

When examining quality-of-life issues in Ukraine, Gukalova (2013) notes that, despite the growing positive trend of some indicators, the nature of its reproduction continues to adhere to an extensive model of society that presents challenges regarding the quality of human habitation. Specific issues of post-communist transformation in Ukrainian cities have been identified in previous research (Mezentsev et al., 2019; Melnychuk & Gnatiuk, 2019; Dronova et al., 2021; Hudzeliak, 2021), addressing how different morphologies contribute to community formation and how they are perceived by their residents. Thus, this study analyses urban housing morphologies, focusing on the features of urban morphological types in different neighbourhoods in Kyiv.

3   Data and methods

Spatial perception, the focus of this study, is an interdisciplinary area that combines both spatial and social components as well as the relationships between them. The spatial aspect of this study includes the definition of historical preconditions related to formation of the areas, modern boundaries, and morphological types, and the study of quality of life defined by certain quantitative and qualitative parameters. The social aspect involves an analysis of parameters, such as the social and psychological identification of individuals in relation to space, a sense of belonging to an area and responsibility for it, the strength of psychological and emotional connection with space, and self-identification as being a part of a community. The following types of social interactions are also studied in this context: mutually good neighbourly practices, organized interrelationships, and public project activities in the community (Paniotto & Kharchenko, 2017).

The spatial and historical features that we examine focus on the morphological types of neighbourhoods identified by the planning documents in Ukraine (Derzhavni budivelni normy, 2019):

- Neighbourhoods with detached houses (Zhulyany): an element of urban development formed by individual houses and blocks of houses with plots of land.
- Neighbourhoods with low-rise perimeter blocks (Podil): a historically formed primary feature of urban space comprised of enclosed or semi-enclosed blocks of buildings (two to three stories high) along thoroughfares (20 to 50 hectares). They can have a perimeter form or stand in historically mixed neighbourhoods.
- Soviet high-rise neighbourhoods (Rusanivka): areas with apartment buildings with adjacent land of 80 to 400 hectares that are separated by main streets and roads of citywide importance. Such neighbourhoods as a morphological type were formed during Soviet urban planning. There are separate subtypes of medium-rise buildings (up to five stories) and high-rise buildings (over five stories).

This study was conducted in two stages. During the first stage, the authors collected and analysed open data from the State Statistics Service and from public organizations, research institutions, and enterprises. The methodology was based on the application of criteria that measured both qualitative and quantitative characteristics of each neighbourhood. We evaluated the indicators related to quality of life: ecological (air, noise pollution, and harmful enterprises), economic (jobs and spatial multi- or mono-functions), and social (public spaces,

Figure 2: Research methodology (illustration: authors).

squares and parks, educational, healthcare institutions, and trade and catering facilities). These data as well as historical preconditions and population density were taken from open sources. To evaluate social interaction, public participation level, and inclusiveness, we considered approved municipal projects in the public budget. Thus, the comparison of neighbourhoods in terms of quality of life were performed based on certain criteria (Figure 2) used in calculating the integrated score evaluation. For a complex expert assessment of the quality of life in each type of neighbourhood, we used a point scale from 0 to 3 (lowest to highest).

The quality-of-life measurements were enhanced by examining behavioural patterns and residents' perception of their neighbourhoods. Thus, the second stage included field sociological studies of space perception (Figure 2). First, five in-depth interviews were conducted in February and March 2021 to aid in constructing a questionnaire for a broad sample of respondents. It provided an opportunity to compare specific behavioural patterns, motivations, and reflections of different individuals in the three morphological types. The five people interviewed in-depth were all renters twenty-five to thirty years old (one woman living in Zhulyany, a man and woman living

in Rusanivka, and a man and woman living in Podil). The in-depth interviews were supplemented by a survey of a wide sample of residents. An online questionnaire with twenty-three questions was posted on each neighbourhood's social network (Facebook) in April 2021. The objective was to obtain as many evaluations about basic indicators of space perception as possible. The twenty-three questions about quality of life were assessed in the following thematic categories: accessibility of facilities, transport accessibility, level of amenity development, level and quality of utilities, noise pollution, air quality, places citizens like and feel safe in, places citizens do not like and do not feel safe in (using mental maps), involvement of residents in neighbourhood life, their experiences of interaction with space, and their overall perception of the neighbourhood space itself.

Figure 2 summarizes the in-depth interviews and surveys in conjunction with an author's expert evaluation based on selected criteria of open sources with analytical, statistical, project, and research information, as well as the final processing of all the data obtained using socio-geographical methods, including analysis, synthesis, generalization, systematization, and mapping.

Figure 3: The three neighbourhood landscapes; (a) Zhulyany (source: Dom.ria), (b) Podil (source: Kyiv heritage guide), (c) Rusanivka (source: Informator.press).

4 Results

4.1 The neighbourhoods in Kyiv's history

The selected neighbourhoods developed in different historical periods and under different socioeconomic conditions. This timing had a major impact on the construction type and formation of the housing and the perception of this space (Figures 3 and 4). Before it was annexed by Kyiv, the Zhulyany neighbourhood with detached houses was a nearby village, which explains the existence of such a large neighbourhood of detached houses within the city limits. Zhulyany is characterized not only by low-rise detached houses, but also by a lack of typical urban features and practices. Indeed, the landscape has distinct rural features; that is, exclusively rural residential functions, personal acquaintance with neighbours, and some remoteness from social services and shops (Figure 3a).

The perimeter blocks of Podil were built during a significant historical period but acquired their current shape in the late twentieth and early twenty-first centuries. Podil largely consists of so-called "revenue houses", an important feature of which is an active street front with shops, banks, barbershops, cafes, and so on at the ground level. Active facades had a service function, which is typical for Podil today. Today only half of the floors in Podil have residential functions. The ground floor is usually devoted to street retail, but there is also a significant share of offices and cultural spaces (Figure 3b).

The Rusanivka neighbourhood was one of the first spatial experiments by Soviet architects in the twentieth century. The buildings of the neighbourhood are mixed and have a distinct structure: the canal promenade features nine-storey buildings with some sixteen-storey buildings as a spatial dominant (Figure 3c). An important component of the neighbourhood was a very active ground floor; there were shops, hairdressers, and department stores. All the necessary social infrastructure was built within the neighbourhood at the time of construction, including preschools, schools, consumer services, cultural centres, and cinemas.

Both Zhulyany and Rusanivka feature significant green areas but also low inclusiveness within the city landscape. The reasons for this are different. Zhulyany is in a remote area of the city that was included in Kyiv's city structure relatively recently. Its type of planning does not allow it to form close ties with neighbouring areas; thus, interrelations of functions with surrounding areas do not occur. Rusanivka, although located almost in the city centre, is a completely separate area in Kyiv's urban structure. First, the island position of the neighbour-

hood on the Dnipro River and canals acts as a kind of border separating Rusanivka from neighbouring areas. The "thin" transport arteries do not allow for diffusion of urban processes. Second, Rusanivka was planned and designed as a city within a city to provide the necessary functions for a comfortable urban life. Only Podil, located in the heart of the city, is fully integrated into the urban landscape of Kyiv. It has transport accessibility, a small number of green areas, and no gaps in space and social interaction. There is active development of urban processes and active penetration of these processes into neighbouring areas.

An important parameter in the spatial structure and historical context of each of the neighbourhoods, which, in turn, affects the ongoing social processes, is the population density (Figure 1). The population density of each neighbourhood was calculated. The lowest figure is in Zhulyany, with fifteen people per hectare (with a total population of about 6,400). The detached houses result in a very low population density distributed throughout a fairly large area. This low density affects the (in)accessibility of many social functions and transport arteries. The population density in Podil is 135 people per hectare (with a total population of about 23,000). However, the actual number of people using the space in Podil averages three and a half to four times higher than its population because the vast majority of them are not residents of the neighbourhood. This affects many measures, including the perception of Podil's residents, who cannot and do not consider this neighbourhood completely "theirs". The population density in Rusanivka is the highest, with about 150 people per hectare. It should be noted that Rusanivka, unlike Podil, is not a place appealing to tourists. Therefore, the number of users of the space roughly corresponds to the number of permanent residents. However, the Rusanivska promenade is an attractive place for many Kyiv residents, which means its spatial use is uneven over time and fluctuates throughout the year.

4.2 Results of expert evaluation

Among environmental indicators, including air quality, noise pollution, and the presence of harmful enterprises, the best values are recorded in Rusanivka, which is considered one of the cleanest areas of Kyiv because of its distinctive housing and social functions as well as its favourable planning structure. This neighbourhood does not have enterprises with a harmful environmental impact within its borders (Table 1).

When assessing economic indicators, particularly the multifunctionality of space and offering a sufficient number of jobs, we can observe two extremes: completely multifunctional Podil on the one hand and Zhulyany, which has an exclusive
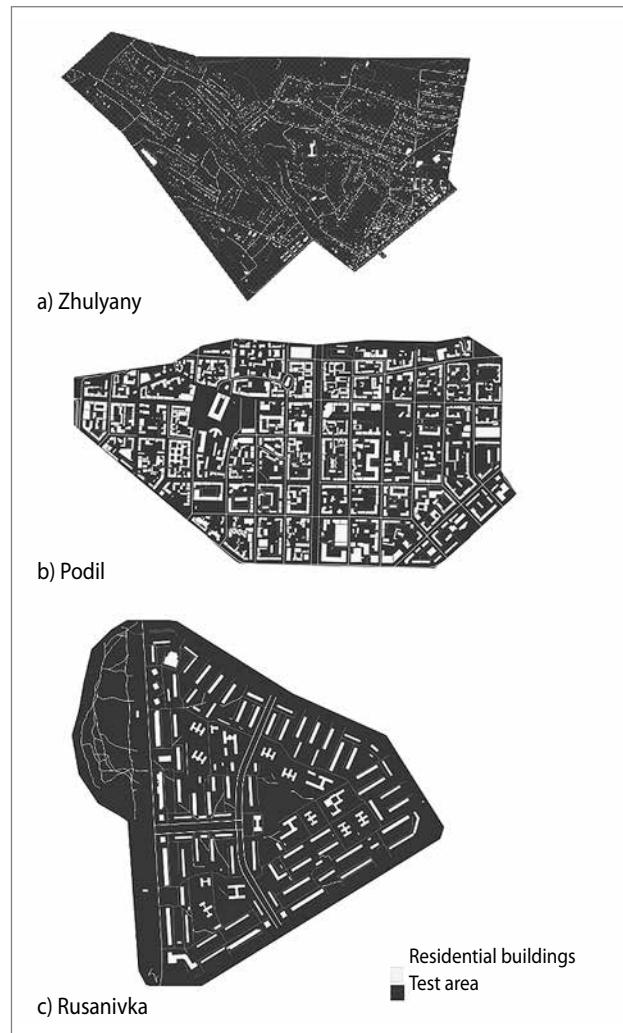
Figure 4: Spatial structure of neighbourhoods (illustration: authors).

Table 1: Assessment of life quality indicators in neighbourhoods.

Indicators	Zhulyany	Podil	Rusanivka
Ecological			
Air quality	2	1	2
Noise pollution	1	0	3
Harmful enterprises	3	2	3
Economic			
Multifunctionality of space	0	3	2
Availability of jobs	0	3	1
Social			
Squares and parks	1	2	3
Educational institutions	1	2	3
Healthcare facilities	0	2	2
Shops and supermarkets	2	3	2
Catering establishments	1	3	3
Safety level	3	2	3
Total score	14	23	27
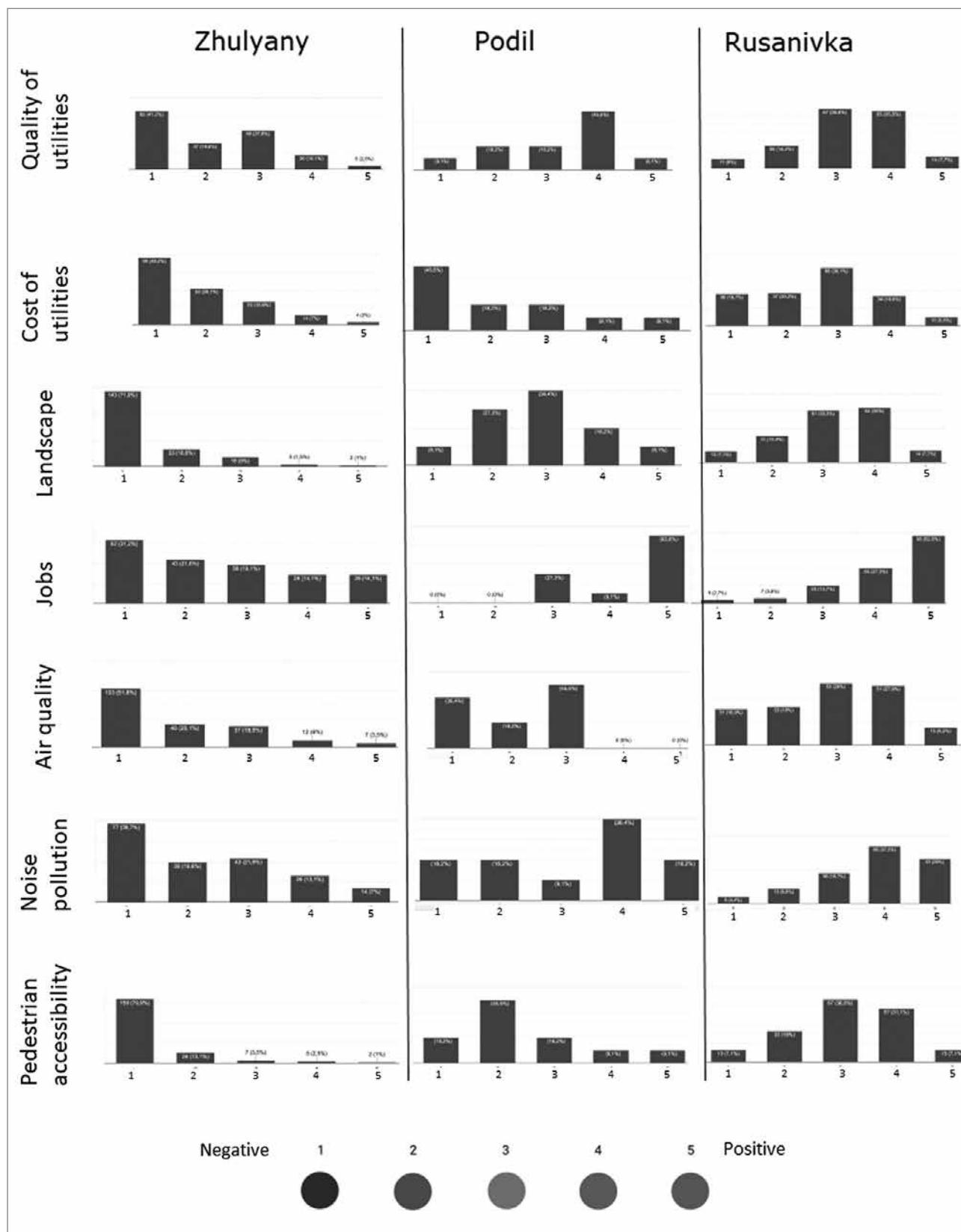
Figure 5: Differences in quality of life based on survey results in the three Kyiv neighbourhoods (illustration: authors).

housing function, on the other. There are practically no office, commercial, or production functions in Rusanivka. This area is well adapted for living and recreation, and it provides all the necessary social amenities, but the vast majority of residents travel to work in other Kyiv neighbourhoods.

Evaluation of social indicators also shows clear differences among the neighbourhoods (Table 1). The social sphere is best developed in Rusanivka. This favourable rating was facilitated by the historical context of the neighbourhood itself; it was designed from scratch under planned communist governance, the major goal of which was to meet and satisfy the residents' social needs. In second place is Podil, with average values for accessibility to educational institutions, medical institutions, and green areas, and above-average values for access to commerce and food. Zhulyany occupies the last place, with no or minimal development of the social sphere. This area does not provide affordable social amenities, which means that residents need to use other spaces to satisfy their own needs. Regarding the security level of living in each of the neighbourhoods, it was found that Rusanivka and Zhulyany are the safest; that is, they have the fewest crimes per 1,000 people during the year. According to the police, Podil is less secure because there are more users of the space. However, even this figure is much lower than the city average. In short, all three neighbourhoods can be considered relatively safe.

Based on all the criteria, a composite value or score for all the neighbourhoods was determined. Rusanivka, with a score of 27, was found most suitable for a comfortable life (Table 1). Podil is in the middle; it has high economic indicators and multifunctionality of space, but it is quite polluted. The lowest quality environment for comfortable living is the Zhulyany neighbourhood with its detached houses, which has poor social and economic functions along with low indicators of ecological comfort.

4.3 Survey results

While surveying residents in each neighbourhood, we also sought to assess their quality of life, involvement in public activity, and experiences of interactions with the spaces. As a result, an average perception of space was performed.

A total of 361 responses were received and examined. The quantity of responses from each neighbourhood were almost equal. The results showed that women were more active than men. The age of respondents in Zhulyany and Rusanivka was generally between twenty-five and forty-five, whereas in Podil the vast majority of respondents were between thirty-five

and forty-five. The share of the population in all neighbourhoods working outside their place of residence and traveling to work was 36 to 43%. However, more than a quarter of Podil's residents work in the neighbourhood they reside in, whereas in Rusanivka this figure is only 12%. In Zhulyany, 20% of the residents work within their neighbourhood, even though there is a shortage of jobs. A significant percentage of respondents either do not work at all or are on maternity or childcare leave. When assessing the quality of life in each neighbourhood through the questionnaire, some clear patterns can be observed (Figure 5):

- The residents of Zhulyany are extremely dissatisfied with indicators related to quality of life. The neighbourhood's environment is not considered comfortable.
- The residents of Rusanivka mainly assessed the area as comfortable to live in, which is confirmed by the authors' assessment.
- Podil's assessment was heterogeneous. There were positive assessments of some features and also some that were negative.

The analysis of public activity and inclusiveness of the population in the life of the neighbourhood showed that the highest level of acquaintance with neighbours was in Zhulyany (90%), and that the highest activity of residents was in Rusanivka (41% participated in voting on the city's public project budget). Podil is more like a "space of strangers". The main consumers of space are renters, tourists, and residents of other neighbourhoods. Only 8% of residents in this area voted on the city's public project budget.

In assessing the perception of space, through both questionnaires and in-depth interviews, it was found that local residents perceive Rusanivka as the most pleasant area. The neighbourhood meets the basic needs of residents according to many indicators, except for jobs. Residents of Zhulyany expressed the least satisfaction with the surrounding space and internal processes. In this area there is an acute lack of basic socioeconomic amenities and ongoing development. Podil cannot be defined clearly based on the survey results. Residents' image of Podil is rather blurry and unformed, and not clearly defined.

Regardless of the neighbourhood where they live, residents' major places with unfavourable ratings (topophobia) are basically the same; that is, noisy highways, crowded places, markets, and dark corners (Figure 6). Places with positive feelings (topophilia; Tuan, 1979) are open public spaces, green areas, bodies of water, and places with historical and cultural heritage.
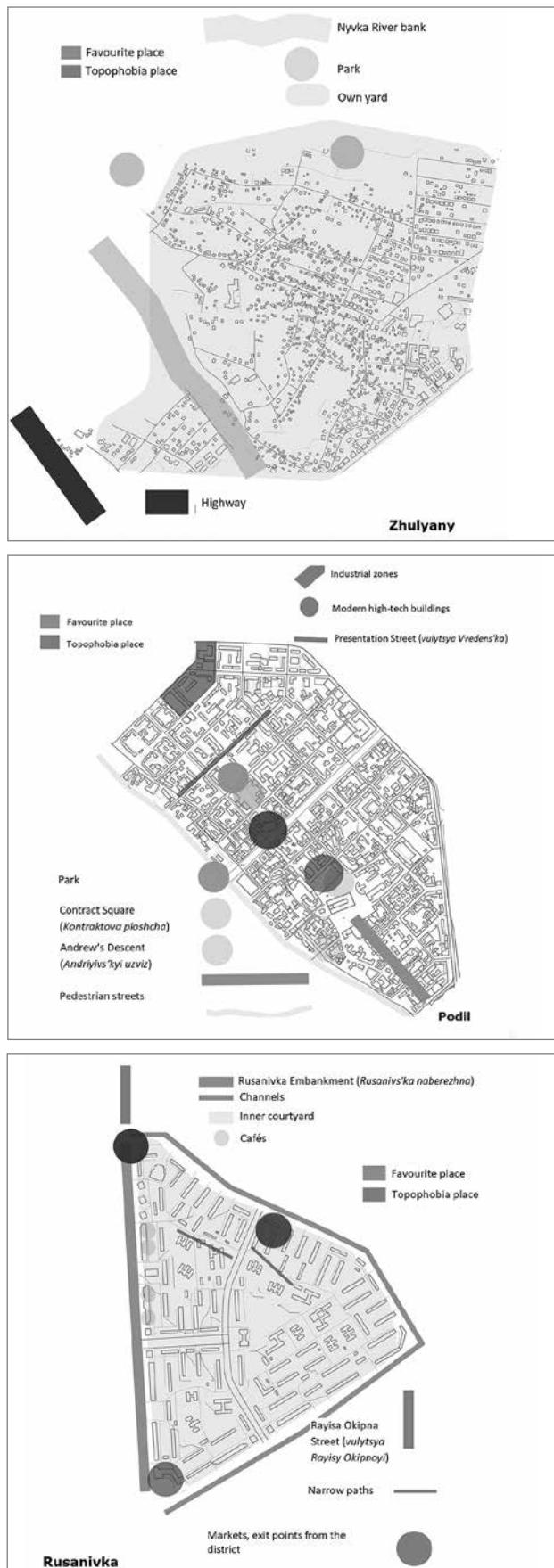
Figure 6: Comparing mental maps of respondents' perceptions in the three Kyiv neighbourhoods (illustration: authors).

5   Discussion

This study revealed some major differences in the perceptions of space and residential behaviour patterns in the three different morphological types of neighbourhoods in Kyiv. We were interested in exploring the features of some basic theories of spatial perception for the three neighbourhoods and discerning whether there were any major differences between their development and residents' views. It was found that none of the neighbourhoods can be considered representative of Kyiv neighbourhoods because each one has a significantly different context in its historical development and spatial nature. For instance, Zhulyany is a hybrid transitional space between a former rural village and an urban area. The main users of space in Podil are not local property owners, but tourists, residents of other neighbourhoods, and renters. Rusanivka is not a typical Soviet neighbourhood, but a well-designed closed spatially functional system that is exemplary even today.

Regarding expert assessment of quality of life, it was found that Rusanivka is the most comfortable living place for its residents in each of the three aspects: environmental, social, and economic. In addition, the community is characterized by a significant amount of social involvement and cohesion, as well as interest in implementing urban projects. Podil – which, in theory, was considered the most comfortable place to live – does not fully meet this expectation because the number of people using space is too high and its active nightlife not only does not guarantee safety but, in fact, is a leading cause of a higher crime rate.

The perception of space was studied through questionnaires, in-depth interviews, and the creation of mental maps that identified the attractive and unattractive places in each neighbourhood. The survey mostly involved residents of the three neighbourhoods that spend a significant part of their time within their neighbourhood and have a firm opinion about the space where they reside. The survey results revealed that the most pleasant area in the eyes of local residents is Rusanivka, which, in most respects, meets their basic needs. Residents of Zhulyany expressed the least satisfaction with their urban space and its internal processes. There is an acute lack of basic socio-economic amenities and development. Podil cannot be clearly defined based on the results of the survey. Local residents' image of Podil is rather blurry and indistinct. Young people that took part in the in-depth interviews generally associate Podil with restaurants, walks through the old streets, and nightlife. They associate Rusanivka with quiet cosy courtyards and the waterfront, and Zhulyany is not perceived as a separate area. It was found that a clearer and deeper image of a neighbourhood comes from those respondents that had some previous

experience of living in areas with a similar morphological type and consciously sought a similar one when they moved to Kyiv. Even though renters in Kyiv do not usually take such an active part in the life of their neighbourhoods, they have the opportunity to reflect more deeply on their living space than those that were born and live in the neighbourhood.

In summary, these three selected areas are unique within the context of Kyiv. The results cannot easily be extrapolated to similar neighbourhoods in Kyiv or other cities in Ukraine. The historical context is fundamental in both; that is, the formation of quality-of-life indicators and the perception of the selected morphological types by their residents. The extent of space and place knowledge and involvement in its transformation by Kyiv residents directly depends on their previous experience and understanding of the context of the area where they reside. The results indicate that the Soviet residential neighbourhood of Rusanivka leads in terms of both objective indicators and perception by the residents as the most comfortable living area – a finding that contradicts generally accepted theories about exemplary and attractive morphological types. Rusanivka shows that in making urban decisions – regardless of the political background, historical roots, and physical design of the buildings – priority must be given to generating some human-centeredness, a deep thoughtful integrated approach to planning in a wide context, and an emphasis on meeting residents' needs for social interaction, comfort, and services, with special attention devoted to the spaces and places where everyday human practices are carried out.

6   Conclusion

Although this study has answered some questions about quality of life in three different neighbourhoods in Kyiv, additional research is needed. First, the residential neighbourhoods of Kyiv should be compared with those in other large and small cities in Ukraine. Are there similar housing and commercial neighbourhoods in Kharkiv, Dnipro, or Odesa? Second, it should be established whether there are any differences in the perception maps of the elderly, middle-aged, and youthful cohorts in Ukrainian cities. Third – and undoubtedly this should be the highest research priority – it should be determined what kind of rebuilding of large and small cities needs to be conducted following the Russian invasion of February 2022. Will rebuilding follow chaotic neoliberal intervention, serving the economic priorities of developers only, or will it apply some positive methods of Soviet housing and neighbourhood complex planning but with flexibility in the process and desired impacts of urban redevelopment, bearing in mind the necessity for public participation in making decisions? It is certain that

reconstruction will take place in various forms and designs, and this will merit the attention of geographers, social scientists, architects, and planners in observing what the priorities and desired outcomes are.

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Where to improve pedestrian streetscapes: Prioritizing and mapping street-level walkability interventions in Cape Town's city centre

Pedestrian interventions for healthier and more inclusive streetscapes can be powerful mechanisms to increase the safety and comfort of walking in African cities. This article proposes a multiscale walkability analysis approach to identify both suitable streets for pedestrian travel and problematic areas requiring small-scale improvements (e.g., pavement repairs, building maintenance, streetlights, and public seating). We applied a GIS-based framework to the central urban area of Cape Town, South Africa, which presents complex social and environmental challenges. For each street-and-crossing segment, a virtual pedestrian streetscape audit tool was used to collect micro- and mesoscale environmental indicators and assess the quality of public space. This composite street-level assessment tool was weighted with a space syntax analysis indicator (i.e., spatial integration) to detect the network's most interconnected and high-priority pathways. The Jenks natural breaks classification algorithm was used to classify scores for each segment, which ultimately found that the highest-priority streets for redevelopment are clustered in Bo-Kaap, a relatively disadvantaged, multicultural, and hilly district on Cape Town's west side. Policy recommendations are evaluated to increase the quality of the urban environment and the city's overall attractiveness to pedestrians. The proposed methodology facilitates more effective place management and classifies the city's needs in improvements, minimizing both time and budget costs.

Keywords: walkability, pedestrian mobility, built environment, Google Street View, Cape Town

1   Introduction

Building healthier transportation systems and more walkable and inclusive streets is vital to achieving high urban sustainability and liveability levels (Loo, 2021). *Walkability* is an umbrella term that considers the quality of the built environment as it facilitates walking (Forsyth, 2015). The concept has received substantial research interest; it has been associated, inter alia, with public health issues (e.g., physical inactivity, obesity, hypertension, and cancer; Sallis et al., 2016; Cerin et al., 2022), air pollution (Marshall et al., 2009), transport equity and car dependence (Knight et al., 2018), and real estate markets (Trichês Lucchesi et al., 2020). Thus, assessing walkability is a good way to measure the impact of urban mobility and spatial planning policies on pedestrians.

Measuring walkability is a complex task involving a variety of methods and datasets. Fonseca et al. (2022) list thirty-two attributes of the built environment that influence walkability, as well as sixty-three measures related to land use, accessibility, street network connectivity, pedestrian facilities and comfort, safety and security issues, and streetscape design. In another example, the 3D concept (Density, Diversity, Design) proposed by Cervero and Kockelman (1997) has inspired several GIS-based walkability indices of neighbourhood-level variables, such as population density, land-use mix, intersection density, and retail floor area ratio (e.g., see the GIS-based walkability app developed by Frank et al., 2010). Notably, Cerin et al. (2022) demonstrate that people living in neighbourhoods with more than 5,700 inhabitants, one hundred street intersections, and twenty-five transit stops per square kilometre are more likely to walk for transportation or physical recreation. In addition, a recent global study identified consistent associations between perceived design features and walking across twenty-one countries with different development profiles that include land-use mix diversity, land-use mix access, and street connectivity (Boakye et al., 2022). Koohsari et al. (2019) propose a non-data-intensive space syntax walkability measure based on space syntax integration (i.e., urban form) and population density (i.e., urban function). Bartzokas-Tsiompras and Bakogiannis (2022) assessed the fifteen-minute walkable city idea across 121 European metropolitan areas using comparable indicators of walking accessibility to seven destination types (i.e., schools, food shops, population, recreation, restaurants, green spaces, and hospitals) and the PROMETHEE II multicriteria approach. Some researchers distribute questionnaires, such as the Neighbourhood Environment Walkability Scale framework, to measure perceived walkability levels (Adams et al., 2009), and others apply virtual or in situ streetscape audits (Brownson et al., 2004) to capture more policy-amenable features (e.g., crosswalks, pavements, buildings, streetlights, aesthetics, and fear of crime).

However, African walkability research is still limited (Lofti & Koohsari, 2011; Ramakreshnan et al., 2021) and comprises only 1.5% of the global walkability literature (Hasan et al., 2021), even though African people are more active for transport (56 min. a day) than the global average (43.9 min. a day) (UN-Habitat, 2022: 13). Previous African walkability studies have found that, compared to North American or European urban settings, different environmental attributes influence walking in Africa. For example, the perception of traffic safety in African environments is incidental to utilitarian walking because local populations tend to be more familiar with handling dangerous and congested roads; rather, it is the perception of crime that deters people from walking (Oyeyemi et al., 2017). Furthermore, Oyeyemi et al. (2017) indicate that local identifiers and aesthetics do not encourage pedestrian trips because African populations generally have low expectations about the attractiveness of public spaces. Another study in Accra, Ghana, found a positive association between perceived walkability and prosocial behaviour (e.g., pro-environmental behaviour and socially responsible consumption), which is strengthened by urban residents' sustainability knowledge (Opuni et al., 2022).

Globally, prioritizing interventions in the pedestrian environment continues to draw research attention because even minor improvements to the street network can reduce pedestrian travel time and increase sustainable urban mobility (Delso et al., 2017, 2018). The targeted focus of investments in pedestrian mobility infrastructure ensures that resources are used efficiently (D'Orso & Migliore, 2020). Introducing GIS tools in walkability studies has proven to be successful in formulating geographically significant methodologies to characterize road networks (Delso et al., 2017, 2018; Ortega et al., 2021). In this regard, street-level pedestrian suitability analysis can be applied to the urban environment. This analysis combines street network proximity and connectivity with several variables concerning pedestrians' physical environment, and it can generate priority methodologies that easily identify which street segments require improvements (Delso et al., 2019). Priority methodologies provide information about city sectors that require alterations to the built environment to boost urban mobility (Ortega et al., 2021), such as street furniture or pedestrian infrastructure (Delso et al., 2017). Similarly, bicycle suitability analysis relies on common open-source datasets of factors that influence route choices, such as speed limit, slope, and type of cycle lane (Wysling & Purves, 2022). However, these methods can fail to consider audit-based data assessing the microscale elements of pedestrian and public space infrastructure, and they may be insufficient to generate feasible, targeted actions for healthier streets.

Therefore, this study proposes a mixed-methods geographical approach to prioritizing and mapping street-level walkability

Figure 1: Case study area (illustration: Alexandros Bartzokas-Tsiompras).

interventions to improve pedestrian mobility and urban design. This approach combines some of the most important elements of the city's built environment, including microscale environmental factors, which are relatively easy to change, and street-level connectivity, which is harder. The outcome of this approach is Street Segment Suitability (SSS), which indicates the degree to which pedestrians can use a street (i.e., how suitable it is for comfortable walking). The SSS score of every street segment is then subtracted from the space syntax integration to produce a Street-level Redevelopment Priorities (SRP) index. The higher the SRP value, the more work is required for maintenance, renovation, or improvement. Because many African cities lack the transportation research depth that their Global North counterparts enjoy, Cape Town's city centre was selected as a case study.

2   Case study area: Cape Town

Cape Town is the legislative capital and second-largest city in South Africa, with an estimated population of 4.68 million as of 2021 (City of Cape Town, 2022). In recent decades, the city has seen substantial urban growth due to rural–urban migration. Reflecting its apartheid legacy, it retains significant socio-spatial inequalities that reinforce socio-spatial segregation, poverty, and exclusion (Lloyd et al., 2021). From 1980 to 2000, Cape Town's population doubled (Western, 2002) and then increased steadily at a rate of 3.3% per annum between 2000 and 2010 before slowing to 1.5% per annum from 2010 to the present (Scheba et al., 2021). However, between 1998 and 2019, the urban land cover grew from only 625 km² to 679 km², meaning population growth outstripped it by 8.7% (Scheba et al., 2021). This underscores the densification and compaction trend reported by many scholars (Horn, 2018; Scheba et al., 2021). Furthermore, Cape Town is one of the most congested cities in Africa, mainly because of the poor quality of mobility. Its inefficient and unsafe public transportation network, with a network density of about 2 km/km² (UN-Habitat, 2013), is far outpaced by car travel. Indeed, 60% of residents travel by car, and only 4% walk (Deloitte, 2019). In addition, despite a large network of bike lanes (about 450 km), the share of cycling is less than 1%. Meanwhile, with about 7 km of pedestrianized streets, Cape Town has the fourth-largest network (but small in global terms) of pedestrianized streets in all of Africa (Bartzokas-Tsiompras, 2021).

Cape Town's urban fabric ranges from colonial grid patterns to conventional sprawling neighbourhoods (Wilkinson, 2000),
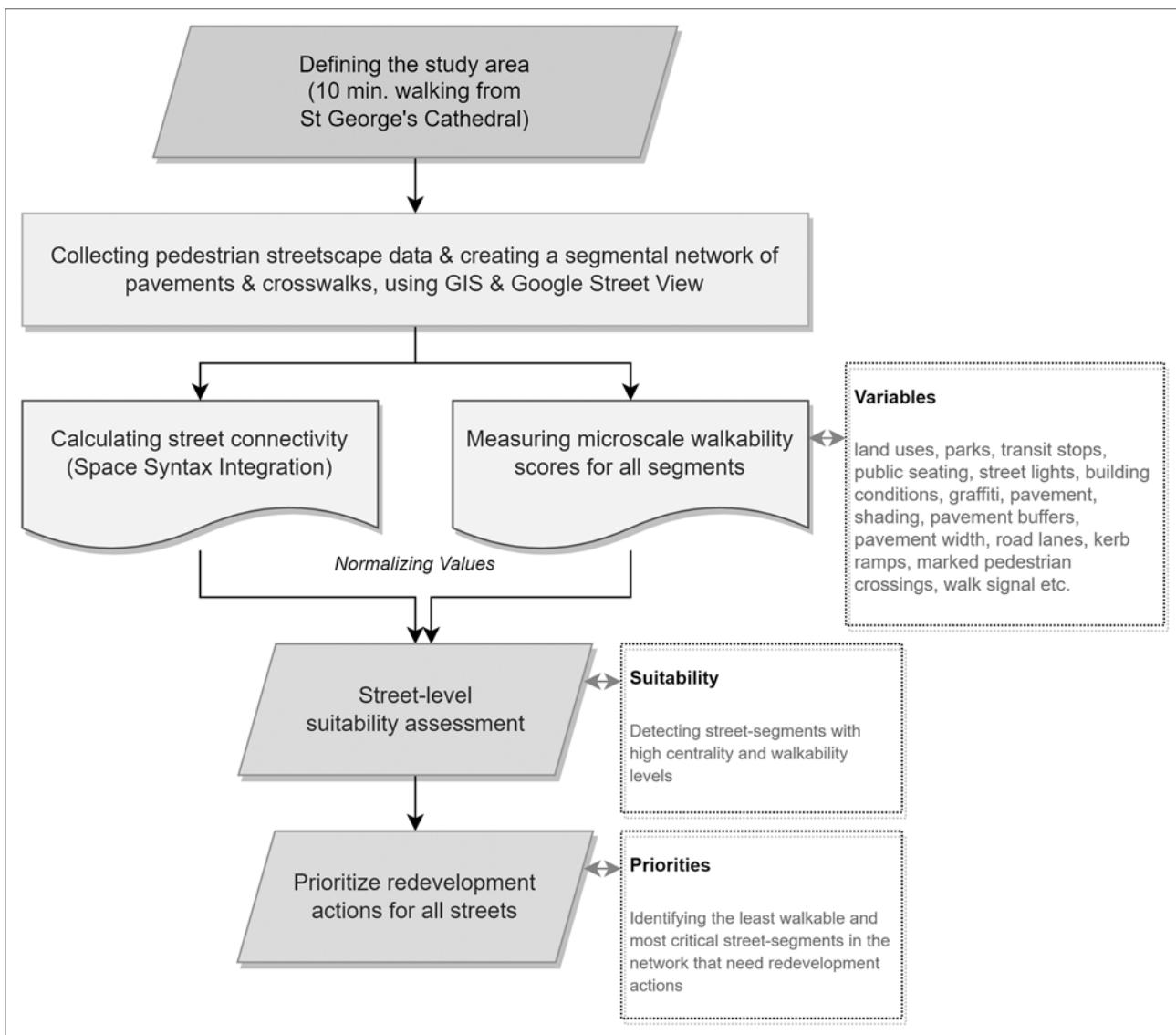
Figure 2: Proposed methodology (illustration: authors).

and half of the total energy consumption at the city level is transportation-based (in many European cities the levels are roughly one-quarter; UN-Habitat, 2013). This complex urban system arose from former social and spatial policies (Ordor & Michell, 2022), notably the spatial inequalities that divided the city under the previous century's apartheid system (Odendaal & McCann, 2016). Apartheid forced the city's African and coloured populations to live in racially segregated residential zones with underdeveloped housing, transportation, and public services (Gibb, 2007). To this end, apartheid transportation policies were designed to decrease connectivity and deter active travel in turn. Bo-Kaap, one of the oldest districts of Cape Town, located west of the city centre, is typical of the city's formerly segregated neighbourhoods. Notably, it is the centre of Cape Malay Muslim culture. This area is now facing gentrification, as residential upgrades increase property values and displace the neighbourhood's original inhabitants (Kotze, 2013).

Therefore, St George's Cathedral was selected as the focal point of this research due to its prominent position in Cape Town's urban core and central business district (Gibb, 2007). As shown in Figure 1, a ten-minute walking distance isochrone from St George's Cathedral circumscribes the study area, taking into account the real street network and not a straight line (Boisjoly et al., 2018).

3   Materials and methods

The proposed method aims to support planners and decision-makers in prioritizing investments for more pedestrian-friendly streets by examining the restrictions that urban planning imposes on pedestrians (Wood, 2022). This method combines multiple aspects of the built environment, represented by space syntax measures and microscale walkability attributes. Data collection is based on pedestrian streetscape observations, col-

lected virtually via the Google Street View service. The new street-level indicators for the central Cape Town area and the assessment method formulate an alternative way to quantify and map problematic public spaces in urgent need of feasible, cost-effective solutions. The process is briefly depicted in Figure 2.

3.1 Street connectivity (syntactic measure of integration)

According to Su et al. (2019), connectivity could be described as the extent to which routes inside a network are interconnected and the degree of various directional connections from origins to destinations. This study expresses connectivity through space syntax theory, which uses topological approaches to analyse how pedestrians move through public space (Hillier et al., 1993). A variety of parameters can express space syntax analysis, but the most important is arguably the syntactic measure of integration, as suggested by several studies (Hillier et al., 1987, 1993). Space syntax integration is a topological measure of centrality that interprets the mean number of changes of direction needed to move from one place to all other places. Therefore, it produces a more complete sense of space depth, rather than metric distance. In other words, per Koohsari et al. (2019), space syntax integration expresses the accessibility of street segments to all other street segments in a given area (i.e., "to" movement) and estimates how many people are likely to be in a given space. High space syntax integration values indicate a well-connected segment, and low space syntax integration values an isolated one (Hillier & Hanson, 1984). Because the case study area includes several neighbourhoods, a local scale was applied to calculate the space syntax integration values within a 250 m radius, thereby relating the characteristics of neighbourhood structure to pedestrian mobility. The QGIS Space Syntax Toolkit (https://plugins.qgis.org/plugins/esstoolkit/) was used to calculate space syntax integration values. This is a QGIS plug-in for spatial network and statistical analysis; it provides a front-end for the essential depthmapX software within QGIS and offers user-friendly space syntax analysis workflows in a GIS environment.

3.2 Street-level walkability framework

A brief modified version of the original Microscale Audit of Pedestrian Streetscapes (MAPS-Mini) tool was selected to perform the prolific task of street auditing (Sallis et al., 2015). The original tool contains fifteen items (mostly binary or frequency questions) that measure crosswalk features, active uses, access to parks or plazas, transit facilities, public seats, streetlight intensity, building condition, graffiti, the presence of pavements, pavement conditions, pavement buffers, bike lanes, and shade

(Geremia & Cain, 2015). Physical activity studies in US cities have validated the composite scores of the original MAPS-Mini tool, finding a positive and statistically significant correlation with increased active travel outcomes for all ages (Sallis et al., 2015). In addition, researchers from Europe have used MAPS-Mini to map and quantify street-level walkability attractiveness and inequities in urban design (Bartzokas-Tsiompras et al., 2020, 2021; Bartzokas-Tsiompras & Photis, 2021).

This study adds four extra variables to the original tool to produce new layers of microscale information, which are relevant either to Cape Town's local context or to potential street-level redevelopment schemes. The first added variable concerns pavement accessibility (S9_1) and asks whether the pavement is continuous. The second relates to pavement width (S13). Both pavement continuity and pavement width provide insight into walking comfort levels. The third added variable describes road characteristics and assesses the number of traffic lanes (S14), which is a crucial parameter in road diet and placemaking programmes. Finally, the fourth relates to street vibrancy by capturing the intensity of shopping streets (S15) and assessing whether a given street segment is purely commercial.

Regarding the street observation method, we apply a hybrid method employing GIS and Google Street View (Lee & Talen, 2014) in a fifteen-day auditing process. Every street segment is audited virtually using imagery data from either 2015 or 2017 (based on availability), and the result is recorded with a single observer in the GIS database (i.e., ArcGIS 10.3). For each street segment, each of the nineteen variables receives either 0 points or 1 point; some variables can receive up to 2 points. Of the nineteen variables, sixteen evaluate the street segment itself, and the rest evaluate the street crossing (see Figure 3). There are 1,025 audited street segments with a total length of approximately 78.6 km. Table 1[1] briefly summarizes the variables and their scores.

The Total Walkability Score (TWS) of each street segment and crossing is equal to the sum of the individual scores of the evaluation of each variable divided by the maximum possible sum (26 points) that an evaluated segment can obtain. The equation is as follows:

$$\text{TWS} = \frac{\sum_{i=0}^{19} x_i}{26} \quad (1)$$

where TWS is the Total Walkability Score, and x_i is the segment's variable.

TWS varies from 0 to 1, with 0 indicating the lowest possible walkability and 1 the highest.
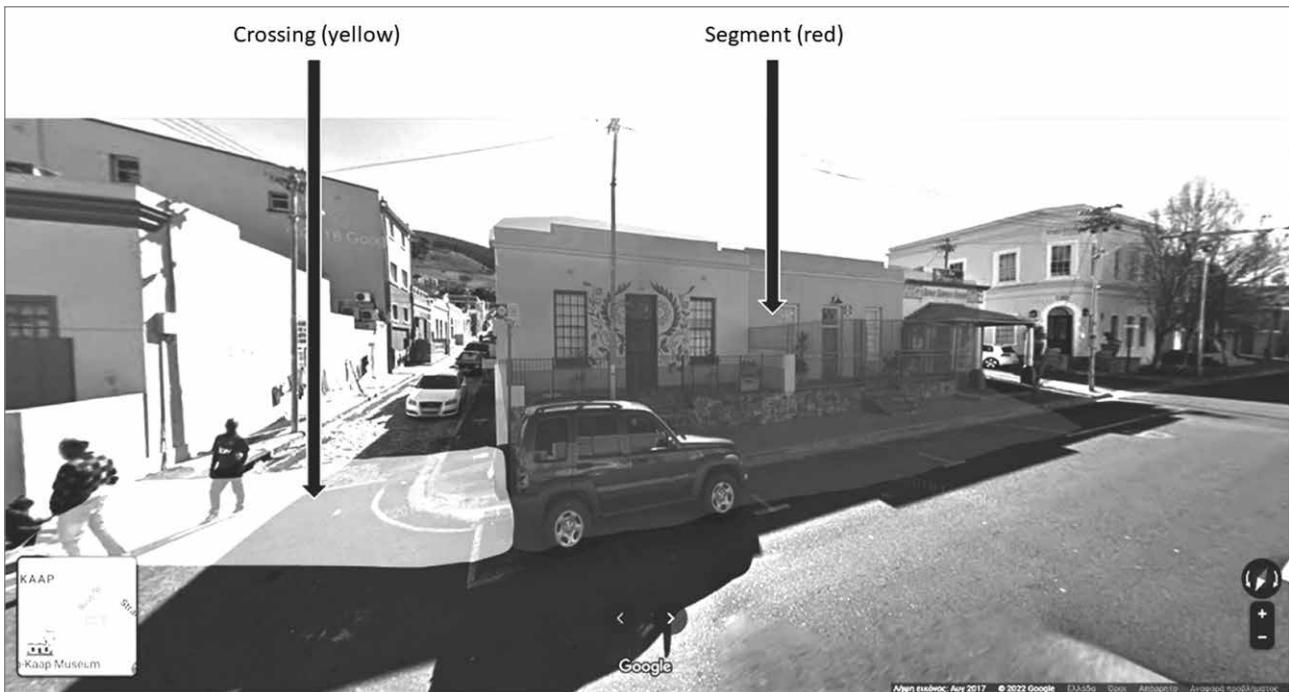
Figure 3: Example of street segment and crossing (source: Google Street View; illustration: authors).

3.3　Street segment suitability (SSS)

Having obtained street-level connectivity measures (i.e., space syntax integration) and walkability scores, the next step in the methodology is to multiply them, after converting the dimensionless values to a 0–1 scale via min-max normalization. The resulting value, SSS, depends on the initial space syntax integration and walkability values being at most equal to or less than the normalized space syntax integration value. The combination of these factors represents the actual state of the pedestrian infrastructure (Delso et al., 2019). The equation is as follows:

$$SSS_i = x_i \cdot y_i \quad (2)$$

where SSS_i is street segment suitability, x_i is the normalized space syntax integration value, and y_i is the normalized value of walkability (TWS).

3.4　Street-level redevelopment priority (SRP)

The final step of the proposed method is to extract and map street-level redevelopment priority (SRP). SRP is obtained by subtracting the suitability (SSS) score of each segment from the space syntax integration value, which represents street-level centralities. The result is the difference between the actual and ideal pedestrian environment, indicating the need for street interventions to improve pedestrian mobility. The higher the

SRP value, the further the street environment is from ideal conditions (as represented by the normalized space syntax integration value). The final step is severing the street segments of highest priority (i.e., the first quantile) and recategorizing them into three classes. The Jenks natural breaks classification algorithm is used because it provides greater emphasis on low-frequency data. The outcome is the identification of the highest-SRP areas requiring immediate pedestrian interventions. These top SRPs are denoted as street segment immediate priorities (SSIP). The equation is as follows:

$$SRP_i = x_i - SSS_i \quad (3)$$

where SRP_i is the street-level redevelopment priority, x_i is the normalized space syntax integration value, and SSS_i is the street segment suitability.

4　Results

The aggregated results of the collected data for each of the microscale variables are presented in Table 2.[2] Public transit stops (S3 = 6.5%) and public seating (S4 = 14.2%) are limited in most parts of the city. The widespread presence of streetlights (S5 = 96.7%) and pavements (S9 = 93.5%) across the city centre, satisfactory building maintenance (S6 = 81.6%), sufficient pavement width (S13 = 74.8%), absence of graffiti vandalism (S7 = 92.3%), and the presence of mostly single traffic lane roads (S14 = 39%) are considered positive elements of
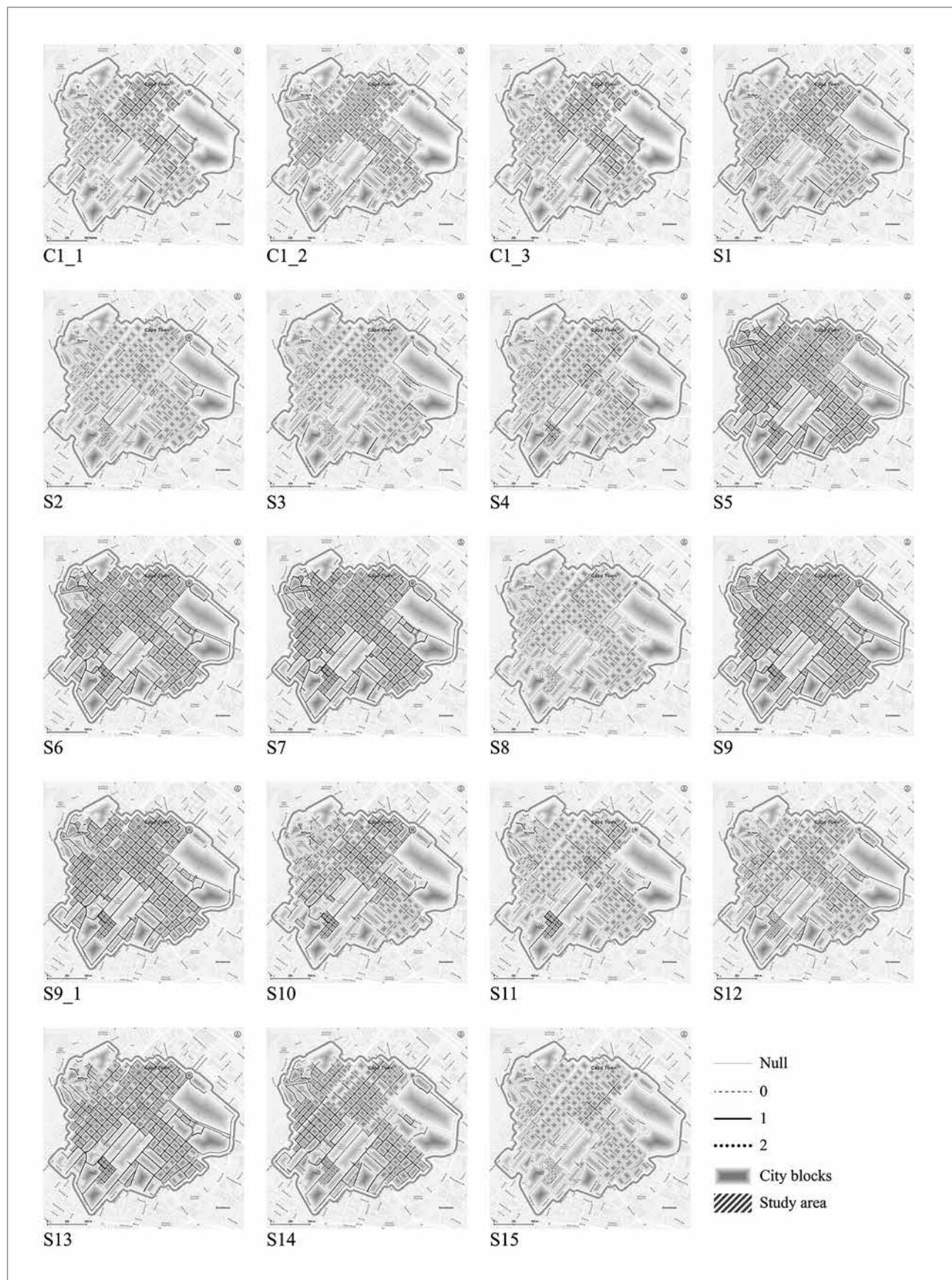
Figure 4: Maps of audited street segments and crossings for each variable (illustration: authors).
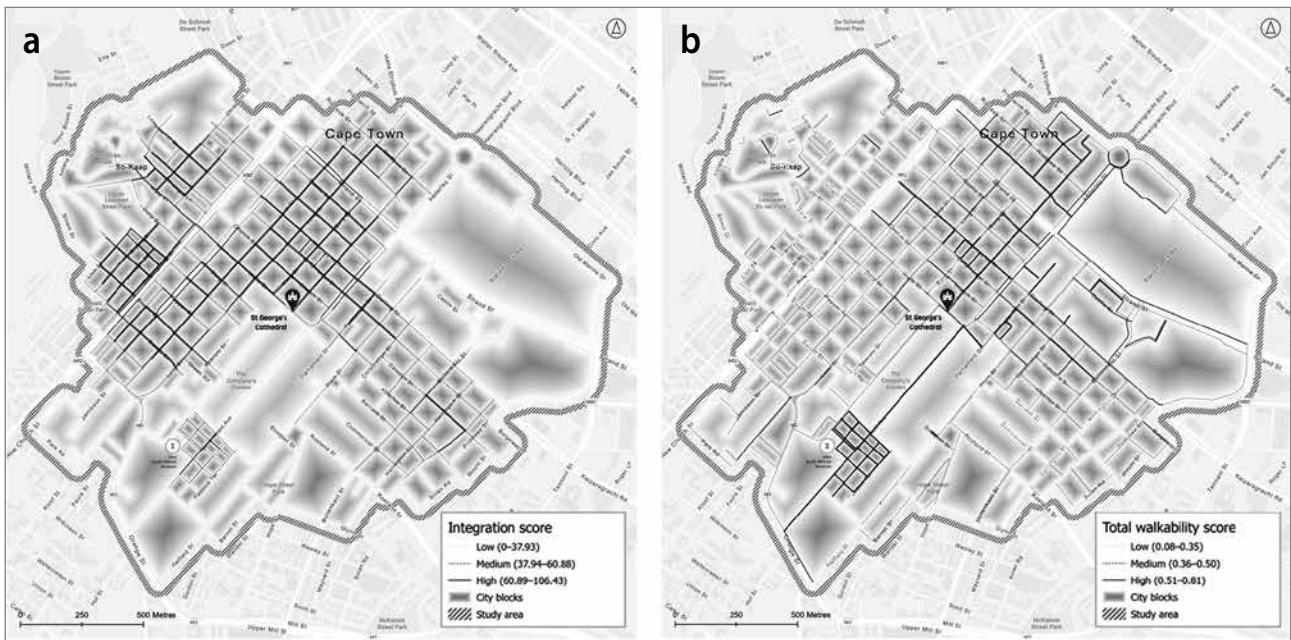
Figure 5: a) Space syntax integration (connectivity) map; b) TWS map (illustration: authors).

walkability. As far as street crossings are concerned, pedestrian walk signals (32.2% of crossings have a pedestrian walk signal), kerb ramps (52.9% of crossings have pre- and post-kerb ramps), and marked crosswalks (39.3% of crossings have a marked pedestrian crossing) are not widespread enough across the city, leaving room for further improvements.

As illustrated in Figure 4, most of the active uses (S1) are located in the central business district northeast of St George's Cathedral. Parks (S2) and public seating (S4) are chiefly concentrated northeast and southwest of the city centre. Transit stops (S3) are sited mainly to the east, across the large avenues (e.g., Strand St.). Poorly lit streets (S5), buildings with graffiti (S7), and streets with no pavements (S9) are concentrated in the western and northwestern area of the Bo-Kaap district. The same pattern follows the variables of building condition (S6) and pavement continuity (S9_1), with dilapidated buildings and non-continuous pavements clustered to the west (i.e., the Bo-Kaap district). Bike lanes (S8) are less prevalent in the area, except in the central business district area northeast of St George's Cathedral. High-quality pavements (S10) and pavement buffers (S11) tend to be located around the focal point, whereas problematic pavement sections are found in the eastern and western districts. Shadier pavements (S12) and streets with fewer than two road lanes (S14) are dispersed across the study area. However, pavements of insufficient width (S13) (< 2 m) are observed mainly in the western area of the Bo-Kaap district. Purely commercial pedestrian streets (S15) are sparse in the city centre; they can only be found northeast of St George's Cathedral; namely, St. George's Mall Street. Regarding crosswalk facilities, we observe many in the northern
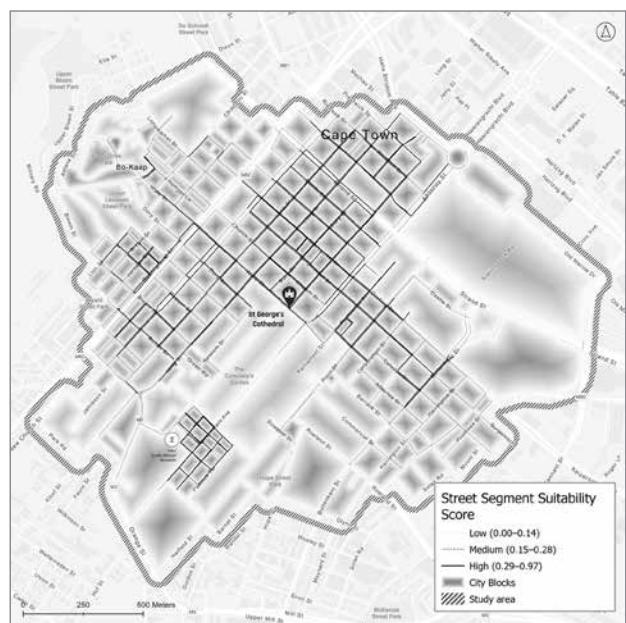
Figure 6: SSS map (illustration: authors).

and eastern parts of the study area. However, it is clear that most of the least safe and comfortable crossings are sited to the west and southeast, in the Bo-Kaap and Zonnebloem districts, respectively.

Figure 5 illustrates the space syntax integration and TWS values. Integration values are directly related to the geometry of the street network, with higher values generated at three discrete clusters north, west, and northwest of St George's Cathedral. Meanwhile, the highest TWS values are concentrated along an axis running through the cathedral focal point in a northeast–southwest direction. Most of TWS's lowest values
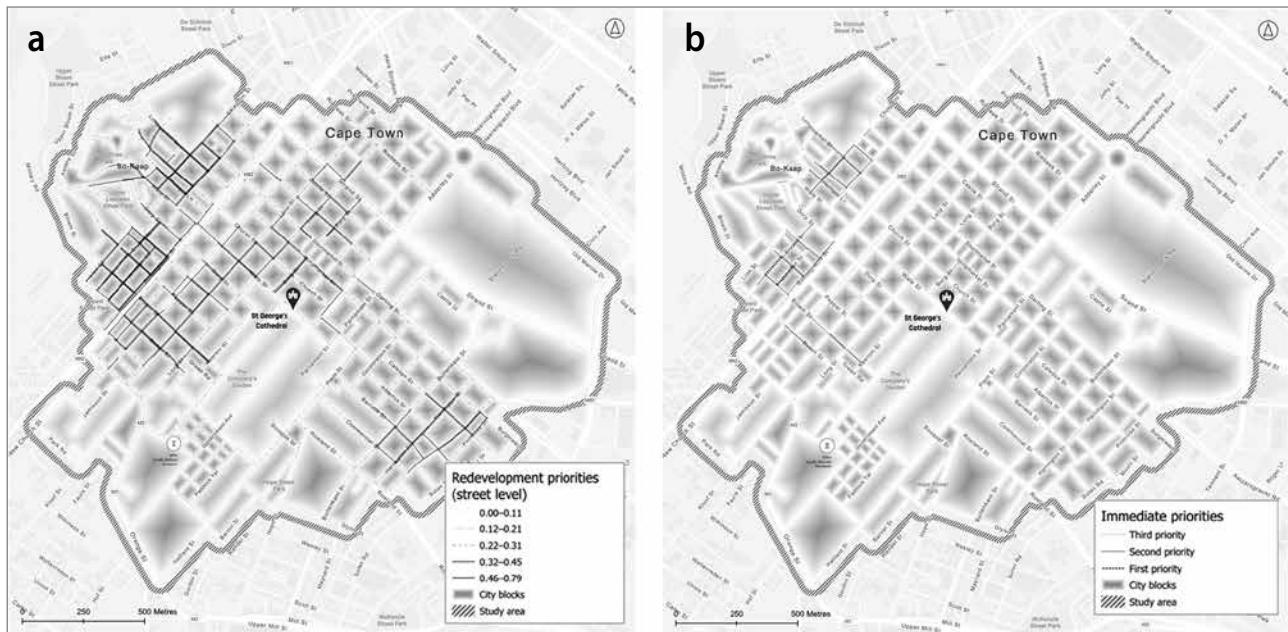
Figure 7: a) SRP map; b) SSIP map (illustration: authors).
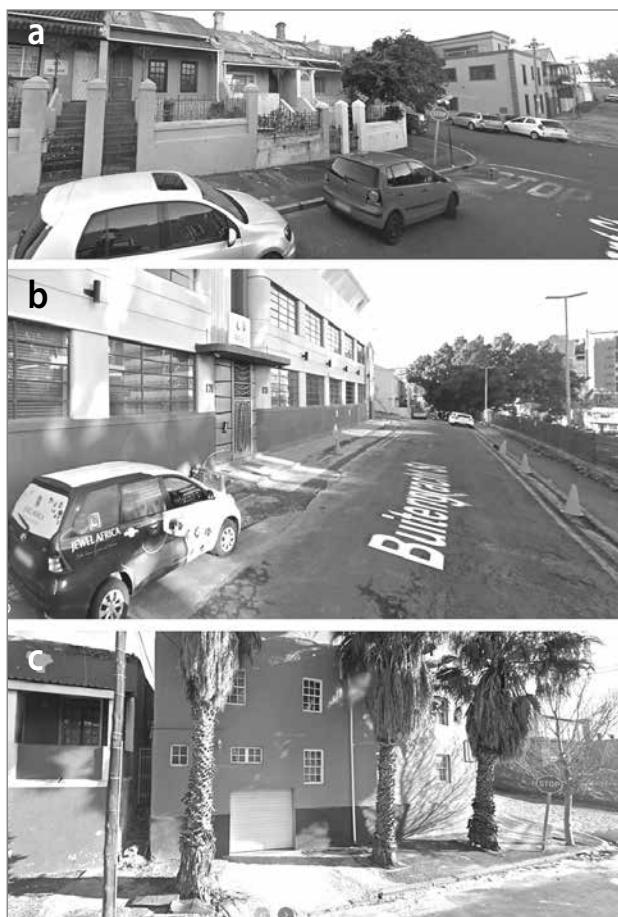
Figure 8: a) Bryant St, a first-priority street; b) Buitengracht St, a second-priority street; c) Jordaan St, a third-priority street (source: Google Street View).

are focused on the northwestern edge of Cape Town's city centre (the Bo-Kaap district), at the location where connectivity shows the highest values.

The SSS map (Figure 6) indicates that the most suitable segments for pedestrians are mostly those northeast and southwest of the focal point, where the highest values of walkability are concentrated. Other high SSS values are observed in several areas in the western part of the city centre area. A large cluster of high SSS values is located around Greenmarket Square, a vivid hub of Cape Town only three blocks northeast of St George's Cathedral. Another smaller cluster of high SSS values is located southwest of the focal point, in a park area between the Iziko South African Museum and the South African National Gallery and South African Jewish Museum.

After subtracting the SSS scores from each corresponding segment's normalized space syntax integration value, the SRP index was derived. Cape Town's areas with the highest SRP values are located on the city's western side; these are the segments that need immediate attention in urban renovation projects. Two discrete pockets of high SRP values (i.e., where the SSS values are moderate to low and the corresponding space syntax integration values are extremely high) are concentrated in the Bo-Kaap district. A similar, but less severe, pattern is also found in a small pocket of the southeast with high SRP values (Figure 7). Ultimately, the segments with the highest SRP values coincide with the most degraded regions of the study area.

Next, to calculate the SSIP, the SRP quantile with the highest priority (i.e., the first quantile) is reclassified into three classes by way of the natural breaks classification algorithm. The first

class indicates first-priority streets; these are the most critical segments in the network with the greatest potential for pedestrian infrastructure improvements. As expected, the SSIP is concentrated in the west of the city centre and in the Bo-Kaap neighbourhood.

To better understand street conditions, Figure 8 shows three example segments: one for every SSIP category. Each street segment has a high space syntax integration value but low pedestrian suitability due to a relatively low TWS.

Case a (Bryant St) belongs to the first-priority category. Here, most of the streetscape-level variables are absent. Well-engineered pedestrian crossings are missing, with buildings and pavement in poor condition. Pavement shading and buffers are non-existent, as are transit stops, active façades, bike lanes, parks, and public seating. These factors combine to produce a low TWS score. A similar pattern is found in Case b (Buitengracht St), except that this segment exhibits good building maintenance and ample lighting, resulting in a slightly higher TWS score. Consequently, Case b is classified as a second-priority segment. Finally, Case c (Jordaan St) has a slightly lower space syntax integration value than Cases a and b, but its low TWS value creates a gap between integration and suitability wide enough to classify this segment as third-priority as far as renovation projects are considered.

This case study identifies street segments of low pedestrian quality. After classification by priority categories, planning authorities can implement urban renovation projects to enhance the quality of the streets in a logical order. Attention to some inadequate microscale variables can potentially increase TWS and SSS values, consequently decreasing SRP, without consuming excessive amounts of time or resources. For example, public seating, streetlights, and pavement buffers constitute small-scale interventions that are neither time- nor resource-intensive. Streetscape audits provide detailed information about inadequate or missing walkability variables, allowing for targeted alterations to the built environment to enhance the pedestrian experience. Improving the microscale features that directly affect pedestrians, such as pavements, crossings, and street equipment, has a significant positive impact on leisure walking and physical activity (Steinmetz-Wood et al., 2020). Thus, focusing on the street segments of highest priority can greatly improve Cape Town's pedestrian mobility.

5   Conclusion

The methodology proposed in this study offers a novel way to prioritize and map street-level walkability interventions. This approach generates new insights regarding microscale walkability issues in the Cape Town city centre by integrating nine-

teen spatial indicators for the pedestrian environment. For cities and countries where street-level data are either non-existent or sporadically collected, strengthening public space findings is vital for addressing complex sustainability issues and designing data-driven policies for healthier and more inclusive transportation systems and communities. For every street segment of the study area, the space syntax integration measure was computed (the initial intent was to use OpenStreetMap data, but the originally produced network of pavements and crosswalks was much more comprehensive and topologically at the scale of interest). This helped map urban centralities in the study area and identify the most critical streets requiring immediate pedestrian interventions. Under this framework, planners and policymakers can better distribute limited investment resources to optimize improvements in pedestrian mobility. Similar geospatial concepts have profound applicability in local strategic plans and are ideal for old neighbourhoods that cannot alter their urban structure or struggle to preserve their local identity, while simultaneously attracting significant pedestrian activity. For example, this framework could be applied to walled towns like the Spanish city of Lugo or Manila's Intramuros district, or to historical districts like the Plaka in Athens.

The findings of this research demonstrate that streets with the greatest need for immediate action are predominantly concentrated in the western parts of the city centre of Cape Town and particularly in the Bo-Kaap district, which lacks the necessary infrastructure to support safe and comfortable pedestrian trips. Improving pedestrian facilities and comfort in the streets of this neighbourhood could increase pedestrian traffic and satisfaction, as well as overall quality of life. However, any potential redevelopment programme should consider the existing social pressures of the district, especially the impacts of racial segregation and gentrification processes (Kotze, 2013). Furthermore, redevelopment schemes should preserve special architectural features, such as colourful houses, mosques, and cobbled streets. When pedestrian interventions align with the socioeconomic features of the region, the assimilation process for the local population is easier (Forouhar & Forouhar, 2020). Such efforts help improve the urban environment and preserve local identity, which in this case is the Cape Malay Muslim culture (Kotze, 2013). Therefore, the proposed street-level priorities could combat the inner-city inequalities of Cape Town's central area, creating more opportunities for the local people, and leading to a more sustainable urban development.

Of course, the findings of this study have some limitations. First, because the microscale audit was made using online Google Street View imagery data, the outcomes were determined by the period of image capture, which in some cases differed. In rare instances, some segments lacked images altogether, thus limiting the reliability of the auditing process.

Second, regarding space syntax integration, the scores on the edges of the designated study area suffer from the edge effect because street segments and crosswalks outside the designated area were not considered. Finally, a significant limitation of this work is that walkability scores have not been correlated with local pedestrian counts or physical activity data. Future research could address these limitations by considering more environmental and social variables (e.g, cleanliness and security) in walkability modelling or by analysing a larger, more heterogeneous study area. In addition, disseminating a survey about walking perceptions could help quantify the importance of urban design features in local mobility patterns, as well as the health and environmental benefits of a more pedestrian--friendly Cape Town.

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Notes

[1] Available at https://figshare.com/s/838b7c93fb6f187b0880.

[2] Available at https://figshare.com/s/37780a5dbdc821dda717.

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Igor BIZJAK

Accessibility of buildings for the functionally impaired: An inventorying method using online tools

The situation in Slovenia in terms of the accessibility of public buildings for functionally impaired persons is concerning. Most often people with disabilities already face barriers when accessing the building (no disabled parking available, stairs leading to the entrance into the building, thresholds that are too high, doors too heavy to open, handles set too high, etc.) and then in the building itself (staircases, unadapted lifts, insufficiently large toilets, etc.). To show potential barriers to the functionally impaired as well as the building owners and maintenance staff, a method is presented for inventorying building accessibility for the functionally impaired using online tools. The method relies on relevant universal accessibility legislation and standards, and it is important because it facilitates an accurate and comparable evaluation of potential barriers and adaptations already in place. Thus, it functions both as a multifunctional framework for evaluating the accessibility of all buildings, which provides an overview of and displays potential barriers to building owners and maintenance staff, and as a guide to building accessibility for the functionally impaired. Also presented is the method's implementation in the online system for inventorying building accessibility, which makes it possible to monitor building accessibility for the needs of the functionally impaired and provides an overview of the barriers detected for the building owners and maintenance staff.

Keywords: accessibility inventorying method, functionally impaired, accessibility monitoring system, indoor accessibility, online app

1 Introduction

Article 26 of the Charter of Fundamental Rights of the European Union (2012, 401) "recognises and respects the right of persons with disabilities to benefit from measures designed to ensure their independence, social and occupational integration and participation in the life of the community." The third operational objective of the European Action Plan 2006-2007 addressing the situation of disabled people in the EU (Commission of the European Communities, 2005) envisages improving accessibility for all, which is connected with the principle of design for all. This principle promotes the design of the environment and various aids that can be used and accessed by all without major barriers and without the need for specialized design and adaptation of the built environment (Hanson, 2005). In the European Union, the right to accessibility of the built environment, information, and communications is addressed from two aspects. The first refers to the right of the disabled to social inclusion and equal opportunities, and the second has to do with the standardization of spatial planning legislation.

In 2014, the European Union Agency for Fundamental Rights posted a report on its website on mandatory accessibility standards for public buildings across the EU member states. The report proceeds from the European Disability Strategy and states that no information was able to be obtained for Slovenia on the standards adopted in this area. Slovenia adopted the ISO 21542:2011 standard (Building Construction – Accessibility and Usability of the Built Environment) in 2011, even though at that time the standard was only available in English. It was translated into Slovenian in 2012 (revised in 2017).

In Slovenia, the fundamental rights to equalization of opportunities derive from Article 14 of the Slovenian Constitution (Sln. *Ustava Republike Slovenije*, Ur. l. RS, no. 33/91-I), which states that "everyone shall be guaranteed equal human rights and fundamental freedoms irrespective of national origin, race, sex, language, religion, political or other conviction, material standing, birth, education, social status, disability or any other personal circumstance." Equal opportunities and non-discrimination of disabled persons is also governed by the Convention on the Rights of Persons with Disabilities, the Equalisation of Opportunities for Persons with Disabilities Act, and the Social Inclusion of Disabled Persons Act.

Barrier-free access is to be provided to all functionally impaired persons. According to Article 3 of the Rules on Universal Construction and the Use of Construction Works (Sln. *Pravilnik o univerzalni graditvi in uporabi objektov*, Ur. l. RS,

no. 41/20183), functionally impaired persons include "the disabled and other persons with a permanent or temporary impairment (e.g., limited mobility, vision or hearing impairment, injuries, and chronic disease), disorders (e.g., intellectual disability), or physical characteristics that may also be the result of various life circumstances (e.g., the elderly, children, and pregnant women)". The SIST ISO 21542:2011 standard (and its versions ISO 21542:2012 and ISO 21542:2022) also covers people with hidden (e.g., stamina and allergy) impairments and people with differences in age and stature (including frail persons). A note is added that this also applies to people with temporary impairments. In addition, the standard defines accessibility (to buildings and parts thereof) as "provision of buildings or parts of buildings for people, regardless of disability, age or gender, to be able to gain access to them, into them, to use them and exit from them. Accessibility includes ease of independent approach, entry, evacuation and/or use of a building and its services and facilities, by all of the building's potential users with an assurance of individual health, safety and welfare during the course of those activities." According to the Building Act (Sln. *Gradbeni zakon*, Ur. l. RS, no. 61/2017), universal construction and use of buildings include the construction and use of buildings accessible to all people, regardless of their potential permanent or temporary impairment.

This article explores the accessibility of buildings for functionally impaired persons, who can also be defined as persons with impairments or disabilities, the disabled, or vulnerable groups. Due to their specific needs, three generally acknowledged types of disability are discussed in particular: blindness and visual impairment, limited mobility, and deafness and hearing impairment.

When referring to the movement of the functionally impaired, a distinction must be made between their movement in the home environment, the external environment of their place of residence and beyond, and in the built environment (i.e., in buildings). To improve mobility and navigation for individual groups of people with disabilities, it is first necessary to analyse the spatial conditions (Keerthirathna et al., 2010; Welage & Liu, 2011; Andrade & Ely, 2012; Calder & Mulligan, 2014; Basha, 2015; Gilart-Iglesias et al., 2015; Wolniak, 2016; Stauskis, 2018; Aini et al., 2019; Slaug et al., 2019; Rebernik et al., 2020; Carlsson et al., 2022) and then develop new technological systems and solutions (collect data, create an online platform, produce instructions, etc.).

The built environment must be adapted and planned for the benefit of functionally impaired people (Vovk, 2000; Hanson, 2005), and the accessibility to buildings or the safe multimodal mobility of people in the urban environment must also be considered (Mobasheri et al., 2017; Szaszák & Kecskés, 2020).

Mobility aids play an important role in the lives of people with disabilities or various impairments; they are indispensable for these individuals to live and work independently and safely. New solutions are based on the development of new methods and the use of new technologies (ICT and others). These aids seek to fill the gap caused by a specific disability (e.g., a sensory or physical impairment).

Smart cities include all their residents and also develop smart mobility for people with various impairments, such as urban pedestrian navigation (Mora et al., 2016, 2017; Wheeler et al., 2020), urban transportation (adapted city buses), safe corridors without barriers (e.g., for people with limited mobility), navigation systems for the blind and visually impaired (Virtanen & Koskinen, 2004; Oliveira Neto, 2019; Telles et al., 2021), or solutions that make it possible to propose spatial improvements (Wang et al., 2021). These solutions are interdisciplinary: they combine navigation databases, geographic information systems (GIS), ICT, IoT user experience, and the use of smartphones and navigation platforms (Cohen & de Duarte, 2016; Rashid et al., 2017; Rebernik et al., 2017; Borowczyk, 2018).

The next challenge for software developers and researchers is planning integrated and inclusive accessibility for the functionally impaired – that is, both outdoor accessibility to buildings and accessibility inside buildings, which is supported with new technologies. Quite a few articles and books have focused on the methodology for assessing barrier-free accessibility of public buildings for all types of disability (Vovk, 2000; Sendi & Kerbler, 2009, 2013; Žolgar et al., 2010; Rener et al., 2011, 2012; Vodeb & Bračun Sova, 2011; Kerbler, 2012; Sendi et al., 2012; Sendi, 2014; Biere Arenas et al., 2016). The accessibility evaluation methods presented usually refer to outdoor accessibility, and some of them also use IT tools. Only a few refer to the evaluation of indoor accessibility. The methods do not seek to define whether a barrier can be overcome by the functionally impaired and whether a solution actually agrees with universal accessibility standards. Standardized accessibility evaluation and thus comparability between the buildings examined are provided for exclusively by sector-specific legislation (the Building Act and the Rules on Universal Construction and the Use of Construction Works) and standards (SIST ISO 21542:2011 and its versions ISO 21542:2012 and ISO 21542:2022). Therefore, a study was conducted to develop a method based on the relevant standards, legislation, and the Rules on Universal Construction. Using online tools and technologies, this method subsequently made it possible to develop a system to evaluate and display the accessibility of buildings for the functionally impaired.

2 Description of the method for inventorying accessibility

The method was developed in four steps:
- Step 1: reviewing online sources related to outdoor and indoor accessibility of the built environment. As part of the review, seeking possible solutions for on-site collection of electronic data on indoor and outdoor building accessibility for the functionally impaired, and possible solutions for organizing the data collected and providing open access to these data for various users (i.e., for functionally impaired persons looking for information on accessibility; the buildings' owners and maintenance staff, who can use this information to remove barriers; and those inventorying building accessibility);
- Step 2: producing a method for inventorying building accessibility for the functionally impaired using digital tools (Bizjak, 2014; Bizjak et al., 2017);
- Step 3: using this method to produce the basic part of a system for online inventorying and monitoring building accessibility for the functionally impaired;
- Step 4: testing the method on the ground using the online system for inventorying building accessibility.

2.1 Step 1: Reviewing literature on indoor and outdoor accessibility of the built environment

The literature review included a keyword search. Keywords such as *accessibility*, *people with disabilities*, *functionally impaired persons*, *disabled parking space*, *interactive accessibility map*, *mobile accessibility app*, and *wheelchair accessible* were used. The search results provided insight into the methods described in research and other articles. They are presented below.

A study from Brazil (Cohen & de Duarte, 2016) focused on the use of a smartphone app called Virtual Accessibility Guide (*Guida de acessibilidade*), which helps functionally impaired people, the elderly, and others visit tourist sites in Brazilian cities. The guide provides information on accessibility to tourist sites, such as disabled parking spaces and accessible routes from the parking area to the site, with a description of barriers in line with the Brazilian technical standards. The method used for inventorying accessibility relies on the technical standards of accessibility, based on which data are displayed to the user.

Another smartphone-related example is an app that provides support to the blind and visually impaired at intersections with traffic signals (Liao, 2013). The app employs sensors built into

the smartphone (e.g., GPS) and a device installed in the traffic controller cabinet that wirelessly communicates real-time signal phasing and timing information. Based on both technologies, blind or visually impaired persons that stop at a smart intersection can use their smartphones to obtain signal phasing and timing information. Because the system uses smartphone sensors, which can also detect the direction of the user's movement, the app detects the user's walking direction at the signalized intersection and accordingly communicates the status of the pedestrian signal to the user, so he or she can safely cross the street. In this case, the method employs external sensors and built-in smartphone sensors to capture data, which are then analysed in the smartphone app and communicated to the blind user in the form of an audio message.

Navigating and crossing streets in a wheelchair can be a major problem if the kerbs at the intersections are not dropped, there are no raised pedestrian crossings, the pavements are too narrow or contain barriers, and so on. Various interactive maps, such as the one provided on the Slovenian website *Dostopnost prostora* (Spatial Accessibility; Internet 1, 2022), can be of great help in this regard. Based on an interactive online GIS system, this site makes it possible to search for and display accessible routes for persons with reduced mobility and the blind and visually impaired (e.g., routes to public toilets, disabled parking spaces, public transport stops, pedestrian crossings, and other public infrastructure). The map also shows physical barriers, such as stairs, inappropriate ramp inclination, and inappropriately dropped kerbs. A similar search tool is also used by the System of Accessible Itineraries designed for Porto, Portugal (Lopes & Alves, 2021). Users can also help create interactive maps of accessibility of public and other buildings (i.e., through crowdsourcing). A good example is the Wheelmap app (https://Wheelmap.org/), an interactive map for smartphones that allows users to provide information on how easily accessible a selected building or destination is (Mobasheri et al., 2017). The map is based on the OpenStreetMap open-source platform, which only allows users to add information to the maps. The Wheelmap app is composed of two parts: one in which users can edit and enter new data on accessibility, and one that serves as a platform for the app's developers so they can test its new functionalities. The app also uses a RESTful API programming interface that makes it possible to access the interactive map data from other apps. A programming interface is also used by the web portal *Dostopnost prostora* (Internet 1, 2022), on which data can be accessed and edited; these data can also be used in other online apps (Rener et al., 2019).

Map developers collect data required to produce interactive maps in two ways: by checking route accessibility on site or by reviewing satellite images and using Google Street View.

Data contributed by app users as part of crowdsourcing are often used to inventory barriers in open space. Users enter their information about places and the barriers in them in the app's database, thus sharing data on spatial conditions with other app users.

Locations and data on accessibility can also be added on the pridem.si website (Internet 4, 2022), which allows users to enter information on building accessibility in a simple manner, using symbols (pictograms). The symbols depict diverse elements (e.g., a symbol for toilets with a door at least 80 cm wide, grab bars next to the toilet bowl, and sufficient room to turn the wheelchair, or a symbol for an accessible common toilet), and the website also provides an explanation of all the symbols, so that users that want to enter information about the accessibility of a specific location can more easily decide which symbol better describes the type of accessibility.

In this case as well, crowdsourcing was used to capture data on building accessibility. The process used a set of symbols that were standardized by the app developers and describe the type of barrier. Users can inventory the accessibility of a building using symbols that they select in the app. This allows all the buildings to be inventoried in a uniform way. The standardized symbols do not adhere to the standards that apply to the built environment. Ljubljana by Wheelchair (2022) is a similar smartphone app developed by the same authors, which provides an overview of building accessibility for people with reduced mobility. However, it does not allow crowdsourcing or adding accessibility descriptions for other users to see.

Built environment accessibility standards provide a framework that can be used for examining whether a specific built environment is accessible or not. Websites providing information on building accessibility for the functionally impaired rely on the practical experience of the functionally impaired that enter the accessibility information (Internet 2, 2022; Ljubljana by Wheelchair, 2022; Internet 3, 2022; Internet 4, 2022). This often means that some buildings are not accessible to all. A good example supporting this is that a specific building is considered accessible if it has a ramp even if this ramp is steeper than what is required in the applicable standard and physically weaker persons cannot use it to access the building without assistance. Therefore, relevant standards should be taken into account when evaluating accessibility. A test methodology for analysing and evaluating the accessibility of public buildings for the functionally impaired using a questionnaire designed based on a review of building legislation was implemented as part of a research project conducted in partnership between Vilnius Gediminas Technical University's Department of Urban Design and Helsinki University of Technology's SOTERA research institute for healthcare facilities (Stauskis, 2005).

This methodology uses a questionnaire that was developed based on the legislation governing universal accessibility in Lithuania and its neighbouring countries. However, the questions referred only to outdoor building accessibility – that is, the routes to buildings, including pedestrian paths, pedestrian crossings, and parking areas (e.g., "Is the required number of accessible parking spaces provided?", "Are pedestrian paths not less than 1200 mm wide?"; Stauskis, 2005: 149). The possible answers to each question were *Yes* (accessible), *No* (inaccessible), and *N/A* (not available). The questions were tested by functionally impaired individuals (a physically strong and a physically weak wheelchair user, a person with crutches, a blind person, etc.). It should be noted that the testing included persons with various physical ability. What may be accessible for a physically strong adult wheelchair user may not be accessible for a physically weaker elderly person or a child in a wheelchair. In addition, the blind and visually impaired, and the deaf and hard of hearing should also be considered. The latter move more easily through spaces, but they are often faced with barriers related to audio communication and the ability to understand complex texts.

Public buildings can vary greatly in terms of architecture and the facilities they offer. Therefore, methods for inventorying them must take universal construction standards into account, be flexible in considering the buildings' facilities, and allow the use of electronic devices (tablets, smartphones, laptops, etc.) and their sensors (GPS, camera, mobile network connection, etc.).

The review of the literature and websites showed that only a few methods for capturing building accessibility data use online tools. Data are most often captured by using online interactive maps and through crowdsourcing. Some methods are supported by universal construction standards or standards governing the accessibility of the built environment. The examples described above, which refer to outdoor accessibility, examine pedestrian areas and level crossings (pavement width, the presence of dropped kerbs at pedestrian crossings, sufficiently large disabled parking spaces, etc.). There are even fewer examples referring to indoor accessibility, which covers entry into the building (stairs, ramps, thresholds) and indoor access to toilets, lifts, accommodation, and so on. In this context, some examples mention the use of standards as a method for describing accessibility as part of inventorying, but without describing the use of electronic devices and online tools in inventorying.

2.2 Step 2: A method for inventorying building accessibility for the functionally impaired using 2.0 digital tools

The relevant Slovenian universal accessibility legislation (i.e., the Building Act and the Rules on Universal Construction and the Use of Construction Works) and standards (i.e., ISO 21542:2011, SIST 1186:2016, SIST 4190-5:2012, and SIST 60118-4:2015) were the starting point for capturing and monitoring data on outdoor and indoor building accessibility for the functionally impaired. Based on these sources, questions were formulated that make it possible to describe a barrier and determine whether it can be overcome. The relevant source (i.e., law, standard, etc.) is added to every question. For example, the questions asked the following:

- Whether there is sufficient room to manoeuvre in front of and behind the desk (at least 1,500 × 1,500 mm, but preferably 1,800 × 1,800 mm); there must be sufficient manoeuvring room in front of and behind an information desk for a wheelchair user to be able to turn around;
- Whether the desk is furnished with assistive listening technology (a hearing induction loop); this tells a hard-of-hearing person whether he or she can speak normally with the person on the other side of the desk.

The questions selected provided a sufficiently large database based on which different sets of questions describing individual elements (e.g., outdoor access to the exterior door, the exterior door itself, the lobby, the information desk, the staircase, rooms, etc.) to be evaluated in terms of accessibility were formulated in the next step. For example, over thirty questions were available for evaluating the accessibility of the exterior door, covering all types of functional accessibility. The questions may also refer to the size and width of the door, door type (e.g., an automatic, sliding, or swinging door), the height and shape of the handle, whether the door is made of glass, what kind of threshold is in front of the door, and so on.

The building data in the database are linked to an electronic inventory sheet, which is why data on individual buildings (i.e., address, a photo of the front, geographic coordinates, the cadastral municipality code, the building code from the cadastre of buildings, etc.) must be entered in the database before starting the inventory. During the inventory, the sets of questions prepared in advance, covering the individual building element assessed, are entered in the inventory sheet. These questions are not linked to the table of questions, which allows redundant questions to be deleted from the sheet (in the case of the exterior door mentioned above, there may be several questions referring to various types of doors, which can be deleted once the relevant type of exterior door is established). The fact that
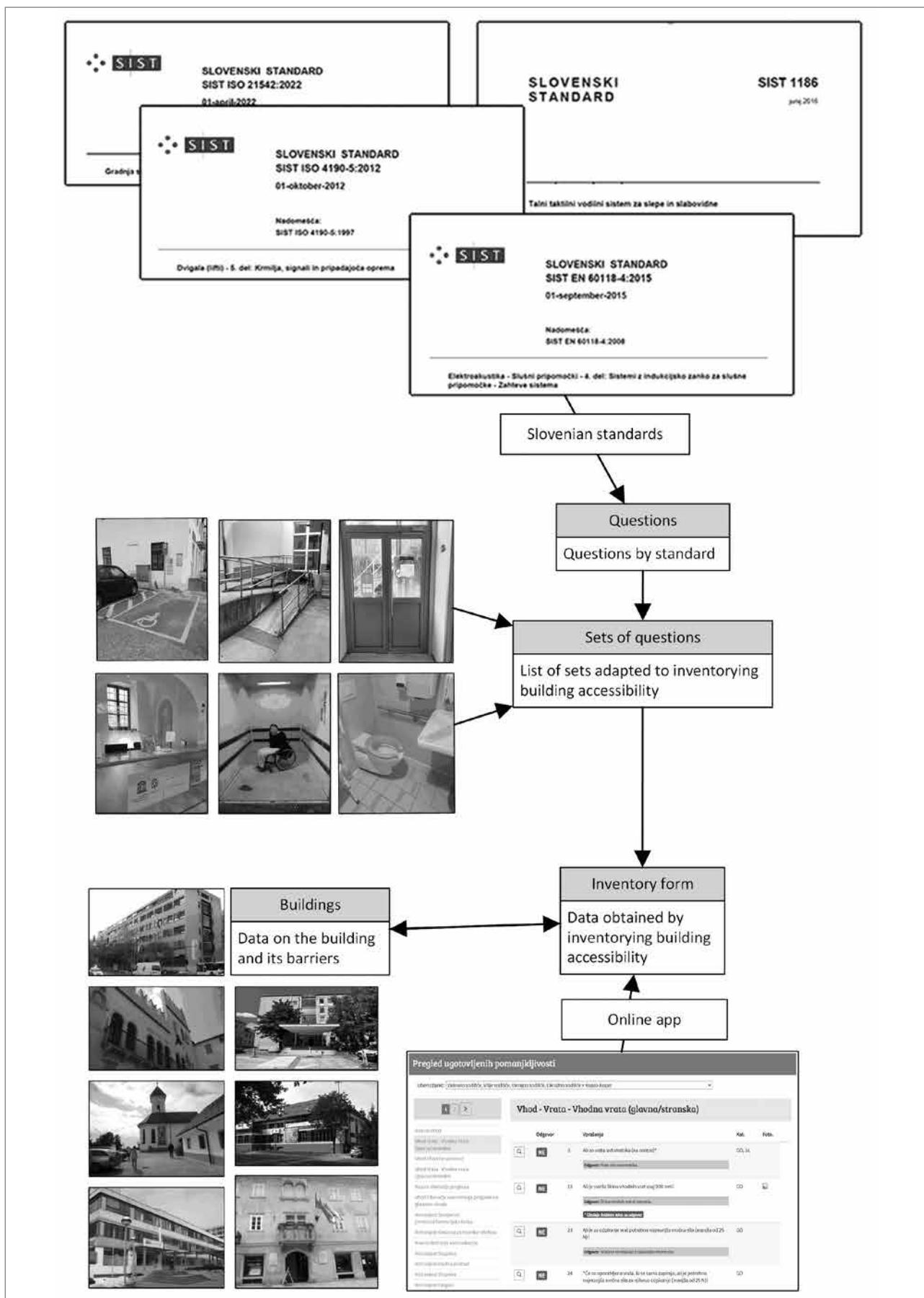
Figure 1: A diagram presenting the method for inventorying building accessibility (illustration: author).
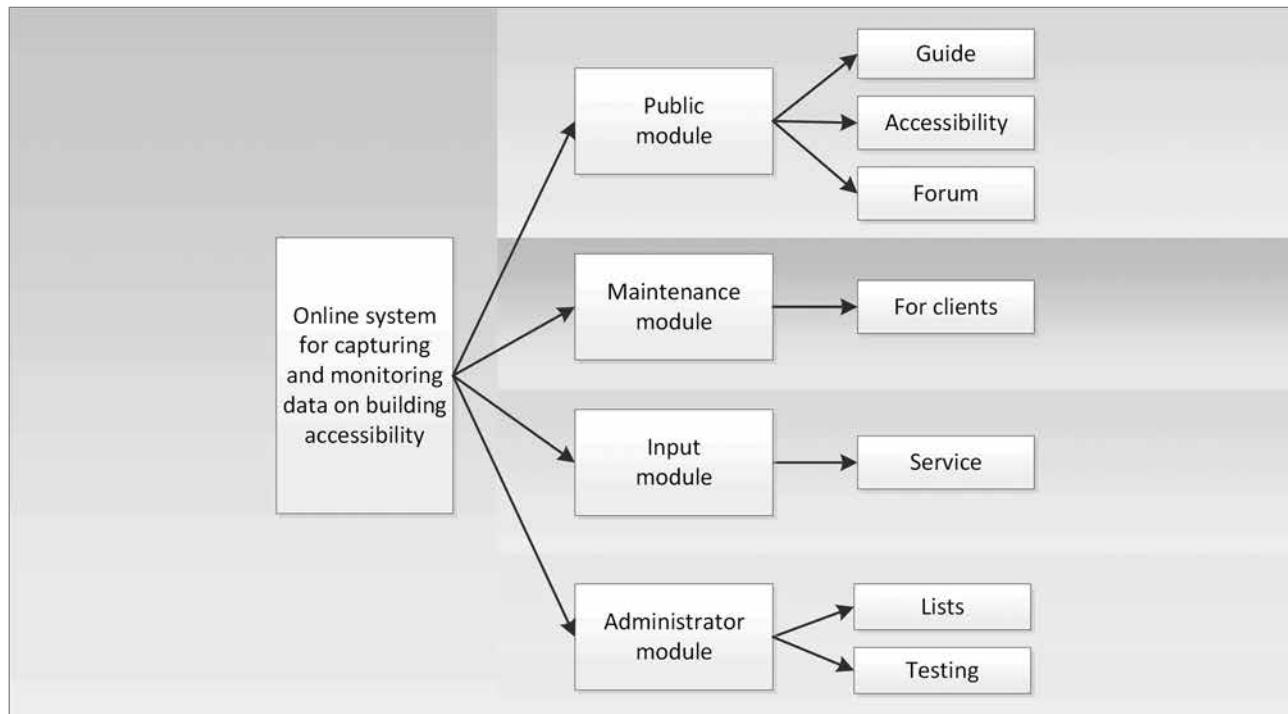
Figure 2: The system's model (illustration: author).

the inventory sheet is not linked to the table of questions also makes it possible for the questions to remain unaltered in the inventory sheet, even though the questions in the table may change due to amended legislation or standards. This retains the chronological traceability of the sources that the questions about the accessibility of elements examined were drawn from. Based on the method described (Figure 1), an online system was produced for capturing and monitoring data on the accessibility of buildings for the functionally impaired.

2.3 Step 3: Producing an online data capturing and monitoring system

Based on implementing the above method in practice, an online system was produced for capturing and monitoring data on the outdoor and indoor accessibility of the buildings studied (Internet 2, 2016). Because this system can also be used by other participants in the evaluation process – such as the clients commissioning the inventory, the maintenance staff, and users interested in whether a building is accessible and how – it includes more functions than merely data capturing.

The system is composed of four interconnected modules (Figure 2). The public module is intended for users that want to check the accessibility of the buildings evaluated. The maintenance module is aimed at the maintenance staff and owners of the buildings examined, for which data have been entered into the database. The input module is intended for on-site building evaluators, who can enter data on the building

examined directly in the database via the internet connection on their smartphones or tablets; it has been developed based on the method for inventorying building accessibility for the functionally impaired using online tools. The administrator module is to be used by system administrators to test the system's operation and add new functionalities.

Only the input module, which was developed based on the method for inventorying building accessibility for the functionally impaired, is presented below. The starting point for developing the input module and subsequently the entire system is the client–server architecture (Figure 3). The core of a functioning system is DNN CMS (Sellers & Walker, 2009; Washington & Lackey, 2010), which operates in the Microsoft Internet Information Server (MS IIS) environment. CMS is an open-source modular system that makes it possible to add programmable modules and thus new functionalities. The modules are based on Microsoft.NET technology, and they all use the MS SQL relational database (Donahoo & Speegle, 2005; Mistry & Misner, 2014). A relational database makes it possible to store any type of data, which are then combined into interrelated tables. Due to database optimization, some repeating data are stored in lists. CMS also includes a module for creating one's own social network.

In developing the system, the XMOD Pro programmable module was used to create the forms for entering data in the database and the templates for displaying building accessibility data from the database (Ryan, 2020). In addition, the API
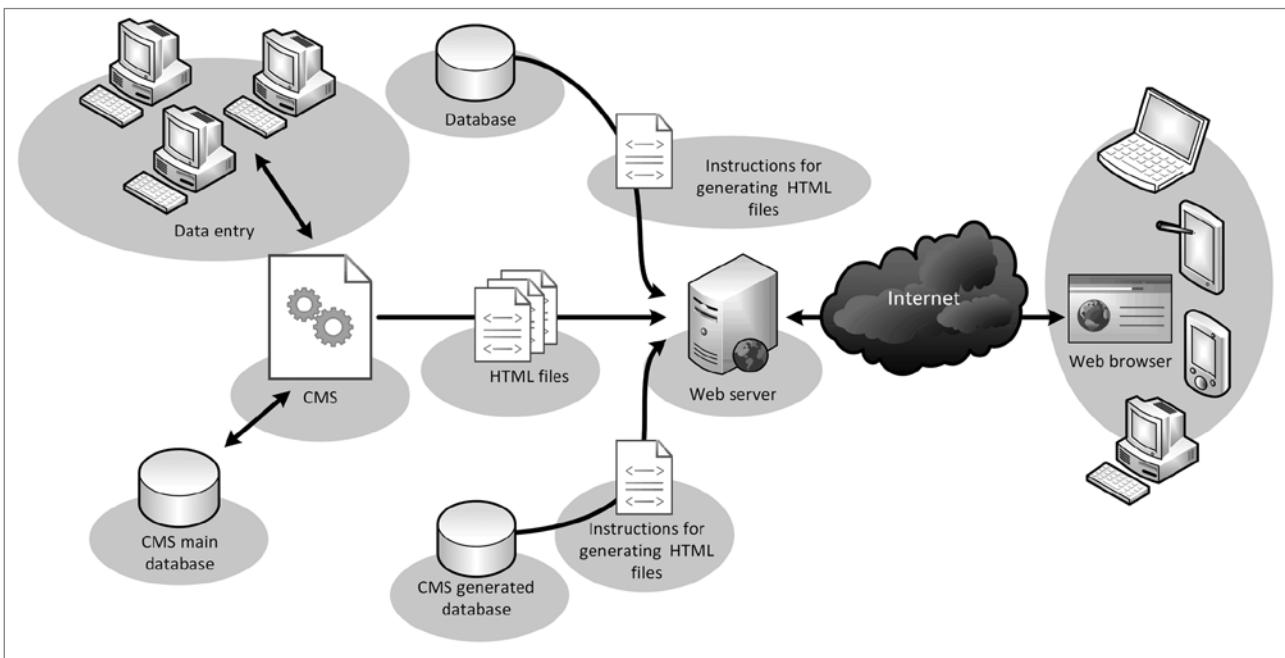
Figure 3: The CMS architecture (illustration: author).
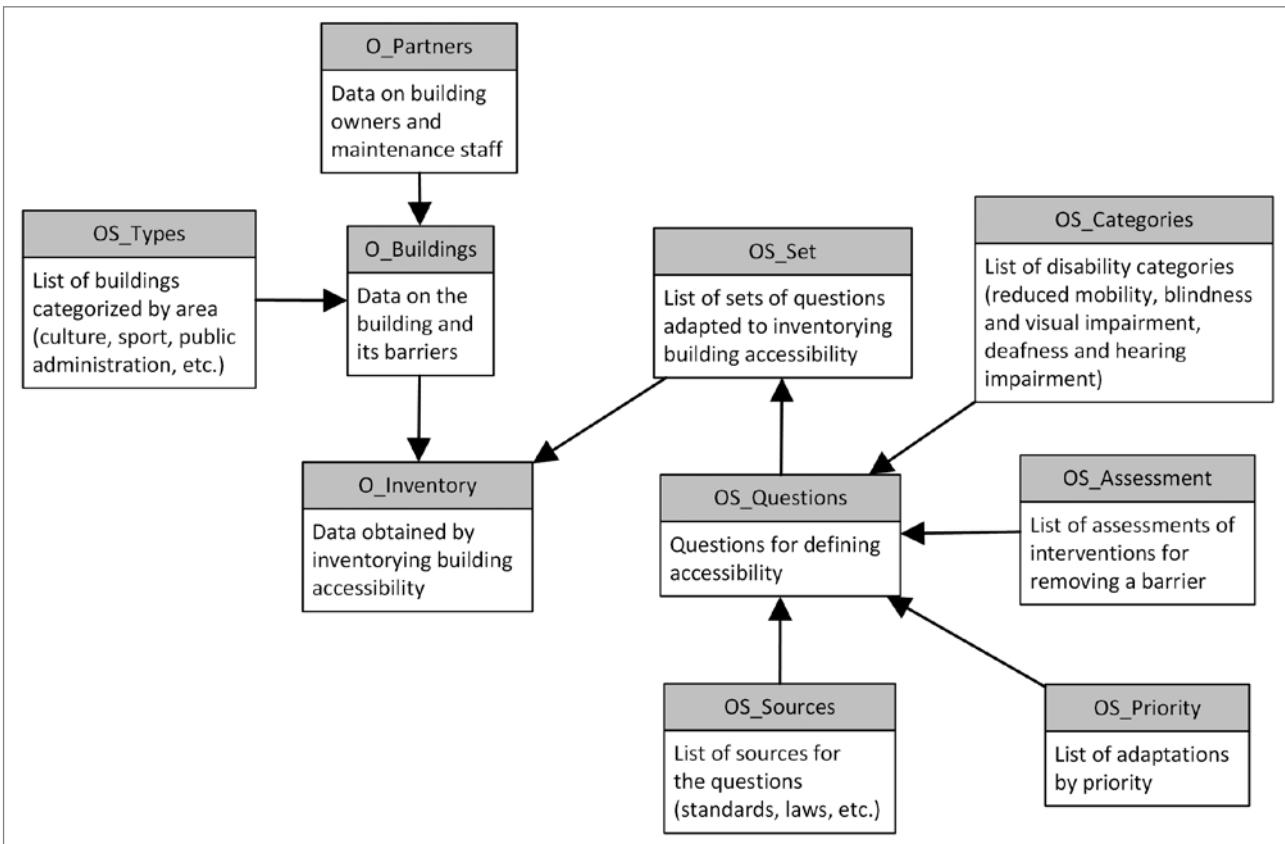
Figure 4: Organization of tables in the database (illustration: author).

REST module was used for the programmatic exchange of data between web portals or services (Vojnović, 2019; Hussein, 2021; Liu et al., 2022; Martin-Lopez et al., 2022), and Razor syntax was employed for programming additional system functionalities (Brind & Spaanjaars, 2011; Chadwick, 2011; Microsoft, 2011). Also used were modules for creating an

online forum and an HTML module for creating descriptive webpages on the portal.

The data captured during the inventory and other data relevant for the system's operation are stored in the MS SQL relational database. The system uses two databases. The first one contains

Figure 5: Part of a data entry form (source: screenshot of the Slovenian online app).

Figure 6: Part of the questions shown in the display template (source: screenshot of the Slovenian online app).

Figure 7: Data on buildings displayed in the display template (source: screenshot of the Slovenian online app).

Figure 8: Form for entering and sorting inventory elements (source: screenshot of the Slovenian online app).

Figure 9: Form for providing quick answers to questions related to a specific evaluation element (source: screenshot of the Slovenian online app).

data that the system uses for its smooth operation, and the second, separate database contains data on the buildings and their barriers. This separate database can be used by external users via the API server, and, at the same time, it protects the main database, which external users cannot access. In the separate database, some data are stored in the form of lists (prefixed with OS_ in Figure 4) that were prepared when the database was created and are rarely changed or updated. Other data (prefixed with O_ in Figure 4) are updated during the building evaluation.

Based on the database, data entry forms and display templates were produced using the XMOD Pro programmable module. Every data entry form makes it possible to enter new data and edit or delete the data already entered (Figure 5). The display templates allow the user to review the data stored in the database tables, sort them, and display them in greater detail if needed (Figure 6). These templates make it possible to enter data on the lists, buildings (Figure 7), and clients ordering the inventories.

Inventorying barriers in front of and inside a building requires a more complex data entry form, which must allow the evaluator to add elements that he or she encounters while inventorying the building. At the same time, the form must be adapted to allow replying to the questions on a tablet or smartphone. Therefore, this form was created using Razor syntax for pro-

gramming additional functionalities in the C# programming language. Figure 8 shows the form for entering and sorting the inventory elements, and Figure 9 shows the same form with answers provided to the questions related to a specific evaluation element. Answers can be provided in a quick or detailed mode. In the quick mode, the evaluator simply taps *Yes*, *No*, or *N/A* on his or her tablet or smartphone. In the detailed mode (Figure 10), the evaluator can add a photo of the barrier or additional notes that can help in removing the barrier.

After all the required data have been entered in the forms, the building's accessibility is automatically displayed in the public and maintenance module. In the public module, the display is available to everyone that wants to find out whether a building is easily accessible and whether there are any barriers at its entrance or indoors. They can also use the guide to search for buildings in the database. In the maintenance module, the clients ordering the inventory can review the potential barriers, based on which they can monitor and remove them.

2.4 Step 4: Testing the method using the online data capturing and monitoring system

Testing the method using the system produced was carried out as part of various research projects (Sendi et al., 2015, 2019, 2021; Bizjak et al., 2021) and other projects, in which one of the goals was to determine the accessibility of public buildings

Figure 10: Form for providing detailed answers to questions related to a specific evaluation element (source: screenshot of the Slovenian online app).

for all types of disability. Testing took place in four stages:

1. Checking whether the questions on accessibility that have already been entered in the database need to be updated or modified in line with any changes to the relevant legislation and standards;
2. Sets of questions by building type (e.g., sports, cultural, judicial buildings, etc.) and its specific features were prepared in advance;
3. For on-site testing, a tablet connected with the system via mobile data was used; a manual system of entering data on printed forms was also used for comparison. In addition to the institute's evaluators, people with disabilities (persons with reduced mobility, the blind and visually impaired, and the deaf and hard of hearing) took part in the testing. Due to the inventory's complexity, the evaluators offered a quick introductory course for the participants before starting the inventory;
4. After the on-site inventories were completed, the results collected via tablets and manually on site were compared against one another.

Until the publication of this article, a total of 286 buildings were evaluated and entered in the database using the online system described. Over the past year, the portal has been visited by 636 users (89% of whom have been new users), with 16,469 visits to various portal webpages recorded. The average visit duration in 1,191 sessions was approximately thirteen minutes. Seventy-four per cent of users accessed the web portal via Windows, 18% via Android, 5% via IOS, and 3% via other operating systems.

3 Discussion

Barrier-free accessibility is the right of each and every individual. It is provided in the constitution and in EU and other documents. It must be ensured in both the outdoor and indoor built environment. It is a mandatory prerequisite for all new construction, as stipulated by laws and standards. With older buildings, barriers must be removed and necessary adaptations made to ensure accessibility for all. Building owners and main-

tenance staff implement the laws that require them to adapt their buildings to meet the universal accessibility requirements to varying degrees of success. They often fail to adhere to the standards in which the necessary adaptations are very clearly defined. To date, there has been no methodology available to check whether adaptations adhere to the applicable standards, nor any system based on such methodology that would make it possible to check the adaptations electronically. Based on the method presented in this article, an electronic online system was developed that makes it possible to check whether the adaptations meet the standards. The sector-specific standards may even be overly detailed for certain barriers. Therefore, a building must be inventoried by a qualified evaluator that understands how functionally impaired people move through places and which barriers they may encounter. Using the online system, the evaluator can check in a very short time for any building whether it is accessible for the functionally impaired and whether any barrier adaptations meet the standards prescribed. If the standard does not envisage a better solution, a qualified evaluator can propose one in the online system.

However, the testing revealed certain deficiencies of the method and the system developed on its basis. The method presented is intended for a detailed inventory of barriers that is based on standards. A detailed inventory allows a detailed inspection of barriers and their potential adaptations. It is of the greatest benefit to the owners and maintenance staff of the buildings inspected because, through a detailed inspection like this, they obtain a great deal of useful information that they can use to remove barriers or make necessary adaptations. It is less useful to the functionally impaired, who only wish to check whether a building is easily accessible, because there are far too many data, which make it difficult to find basic information about access and potential barriers. However, the method is also applicable to simpler inventories. The target research project "Dostopnost objektov v javni rabi za potrebe invalidov" (*Accessibility* of Facilities in Public Use for the Needs of the Disabled; Sendi et al., 2021) provided guidelines for adapting the accessibility evaluation methodology to entering a simpler inventory in the system, which is based on the proposed minimum accessibility standards. Introducing a simpler inventory into the system would allow building owners that wish to enter information about the accessibility of their buildings into the system based on the proposed minimum standards to carry out self-assessments. In this case, the methodology will have to be adapted and the system will have to be improved to also allow for the entry of a simpler inventory. Improvements should include the option to register or log in to a building owners' portal, search through the building register to determine the code of an individual building, define the building's geographic coordinates, and select the building's intended use. This last feature will allow the person entering the data to see questions specific to the building's typology and intended use. The option to enter a simple inventory designed in this way can be used by anyone that would like to inventory the accessibility of his or her building and display that information on a web portal.

4 Conclusion

On-site data capturing using smartphones or tablets is working – but it is working more slowly than expected. Because replying to questions is very complex, this takes more time. On-site data entry should make inventorying faster. In addition, the display on smartphones is not optimized because the app was initially intended for tablets, which have larger displays than smartphones. The system's users, especially the buildings' owners and maintenance staff, welcomed the chance to see the barriers and enter information about their potential removal. Nonetheless, there is still room for further improving the online building accessibility monitoring system. Accelerating the on-site inventory of buildings via tablets is one task that can improve the system. In addition, the smartphone user experience should also be improved. Moreover, tools should be added to the portal to facilitate the use of the online system for the blind and visually impaired, and the method should be updated to also allow the entry of a simpler building accessibility inventory. Once the method is updated, the users, building owners, and maintenance staff will be able to perform self-evaluations. This will contribute to greater usefulness and familiarity with the online system. However, first and foremost, functionally impaired persons will be able to obtain information on building accessibility in one place, and the building's owners and maintenance staff will receive information that will help them remove barriers or modify adaptations that do not comply with the applicable standards.

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metavesolje **metaverse**
digitalna mesta digitally mediated cities
območja za pešce **pedestrian streetscapes**
dostopnost objektov building accessibility
urbana morfologija **urban morphology**
mestna identiteta city identity

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