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Transformative Capacity Building by Systematic Use of Urban Living Labs: A Case Study of Alytus, Lithuania

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This article aims to introduce the concept of *Permanent Urban Living Lab* (*PULL*) as a method for urban transformative capacity building. Since the beginning of 2000s, the urban living labs (ULLs) are being researched and examined as experimental settings that bring together various stakeholders, such as citizens, researchers, businesses, and policymakers, to co-create and test innovative solutions for urban developments. They offer a collaborative and participatory approach to urban solutions that engages and empowers local communities and fosters a culture of a shared foresight process and mutual learning. In the context of local development, the ULLs can serve as a powerful tool for building the urban transformative capacities (UTC) by providing a platform for local actors to develop their skills, knowledge, and networks for intersectoral cooperation, and by creating opportunities for experimentation and experiential learning. The case of Alytus, Lithuania, is an interesting example of how the urban living labs can be used to drive local development. Alytus is a mid-sized city in Lithuania, Northern Europe that has faced a range of social, geopolitical, economic, and environmental challenges typical of the region in recent years, including declining population, high unemployment, and deteriorating public spaces. The aim of this article is to analyse the perspective of implementation of European policies and methodologies presented in the Urban Europe Programme if applied to the search of transformative capacities' building for better city co-governance. In this respect, methods of the quadrupole helix model, urban living labs, force field analysis and different forms of co-creation are discussed as the founding elements for initiating a digital platform for citizens' involvement and participation in urban transformations.

Keywords: urban living lab, urban transformative capacity, co-creation, quadrupole helix model, force field analysis.

Introduction

In terms of the smart city development, urban transformative capacity building (UTC building) as a process is using an urban living lab (ULL) approach and refers to a process of developing and testing innovative solutions to urban challenges through collaborative and iterative processes involving multiple stakeholders, including citizens, businesses, and policymakers (Concilio, 2016). This approach aims to foster innovation, social inclusion, and sustainability in urban development. UTC building refers to the ability of cities to adapt and respond to changing social, economic, and environmental conditions (Castán Broto et al., 2019). This article introduces the necessity of using the suggested method of *permanent urban living lab (PULL) – the approach to building the urban transformative capacity through the use of digital, online forms of co-creation, which are collaborative, experimental spaces, where stakeholders can co-create and test solutions to urban challenges.*

Alytus case

The Alytus city government has adopted an urban living lab approach, which involves creating a collaborative platform for experimentation and innovation in urban development (Strategic operational plan of Alytus City Municipality for 2022–2024). This platform brings together a range of stakeholders, including citizens, businesses, and public authorities, to co-create and test new solutions to urban challenges. As the practical site for evidence-based considerations, a series of meetings of 'community of practice' were organized under the framework of an EU funded project (TANGO-W. ERA-Net Urban Transformation Capacities (ENUTC) Project No. 875022) in which Alytus City Administration (ACM) took part. One example of this approach is the development of a smart waste management system in Alytus. The city government collaborated with local businesses and citizens to develop a waste sorting and recycling system using digital technologies, such as sensors and mobile apps, to improve the efficiency and effectiveness of waste collection and processing. Another example is the revitalization of the city's riverfront area, which had been neglected for many years. The city government worked with local residents and businesses to create a new public space, including a park and a cultural center, that has become a vibrant hub for community activities. As the third example, the Science and Technology Park serves as a platform for collaboration between local businesses, academia, and government, and provides resources for research and development (ACM, 2021). The living lab approach allows for experimentation and testing of solutions in a real-world setting, with the participation of stakeholders from various sectors.

To address these challenges, the local government of Alytus launched an urban living lab in 2018, called "Alytus for Change". The living lab brought together local stakeholders, including residents, entrepreneurs, researchers, and government officials, to co-create and test innovative solutions to urban challenges. Through a series of workshops and events, the living lab developed several initiatives, such as a community garden project, a bike-sharing system, and a public art program, aimed at spatial design projects with involvement of local art community.

As the advantageous side of this practice, the ULL approach has enabled Alytus to build its transformative capacities by fostering a culture of collaboration and innovation among stakeholders. This has helped to address longstanding urban challenges and to create new opportunities for economic and social development. Nevertheless, the non-systematic use of this co-creation methodology revealed the necessity of forming of on-going and freely accessible platform for receiving and exchanging of future transformation-related information among community interest groups. In search of potential forces for the transformative capacity building in a context of urban development through involvement of all stakeholder groups of the city community, a certain number of actors and players on this "stage" has to be considered. The last decade of extensive research in the field of social innovations has led to creation of numerous methods and exercises for citizens' involvement and active participation in decision making about the city's sustainable future.

Addressing the urban questions, the overarching goal of transformative capacity building was set to foster a critical and reflective approach to learning and development that empowers individuals and organizations to create meaningful and lasting change. Different methods for research, learning and development that aim

to empower individuals and organizations to become a part of city stakeholders have been developed and circulated as a result or a product of a variety of European scale projects (Dvarioniene et al., 2015). Having an overall goal of creating a positive change in European communities and in society as a whole, the European Commission facilitates practical activities which involve city administrations, companies, community organizations and academia representatives in building the interconnected nexuses of knowledge, skills, attitudes, and values needed to transform existing systems and structures that could contribute to positive social and environmental changes in local communities.

Transformative capacity building (Keeler, 2019) is based on the principle that sustainable change requires more than just technical expertise or knowledge transfer. It also involves developing the capacity to challenge and transform dominant power structures, assumptions, and norms that contribute to solving the social and environmental problems. Such cooperation may also involve working with diverse stakeholders, including marginalized groups, to ensure that the perspectives and needs of all are considered.

In this regard, many general principles of urban transformations in Europe are embedded in joint programming initiative guiding documents. JPI Urban Europe. SRIA 2.0 (2019) is a joint programming initiative that brings together national research funding organizations and other stakeholders to coordinate and fund research projects that address urban challenges (Lawrence, 2018). This EU Programme aims to foster collaboration between researchers, policymakers, practitioners, and other stakeholders to develop innovative solutions that address the complex and interconnected challenges facing urban areas, such as climate change, social exclusion, demographic change, urban mobility, and energy efficiency.

The ultimate goal of this EU investment is to improve the quality of life and well-being of urban residents, promote economic growth and competitiveness, and ensure the sustainability of urban areas in the long term. According to the particular setting of joint programming initiative JPI Urban Europe, the programme, among others, aims to create impact in three dimensions (*Fig. 1*):

1 Impact on cities. Using the proposed thematic priorities and implementation measures, JPI Urban Europe wants to offer cities room for experimentation, a network of like-minded urban actors, and concrete references that might help them to start similar actions in their own cities. The portfolio of implementation measures is oriented towards shaping an environment to create new transition pathways that correspond to the city's strategies and priorities.

2 Impact on national urban policies. Considering the Agenda 2030 SDGs and the New Urban Agenda of UN-Habitat international and national frameworks for urban development have been reinforced. Utilising the scientific evidence created in the JPI Urban Europe projects, input and references for such policies or related actions can be provided.

3 Impact on R&I policies. By going beyond the use of state-of-the-art instruments JPI Urban Europe creates new insights for future instruments and framework conditions that fit the needs of challenge-driven approaches. (JPI Urban Europe. SRIA 2.0, 2019).

At the same time, the participating Programme owners and funding agencies use the cooperation opportunity to share experiences, jointly test new approaches and create references for their own programmes. Some of the latest guiding principles for the Strategic Research and Innovation Agenda (SRIA 2.0) implementation serve as a basis for implementing transformative capacity building policies at a local level, e.g.: 1) joint investments in urban research and innovation building upon the current portfolio of instruments for R&I projects, innovation actions and alignment of national projects; 2) continued 'labbing', i.e., taking urban living labs to the next generation/phase and fostering capacity building in science, policy, public administrations, and society at large; 3) co-creation and science-policy cooperation throughout all activities and instruments (JPI Urban Europe. SRIA 2.0, 2019).

These considerations lead to the opening of the working hypothesis for analytical work within a topic of urban development: permanently cultivated urban living labs enable the integration of diverse research and co-creation methods, fostering transformative capacity building for the future development of cities. Therefore, in this study, the concept of permanent urban living lab (PULL) is introduced and discussed. The following parts of this article are dedicated to integrally confirm the hypothesis for the sake of better collaborative governance of European middle-sized city in transition economy.

Fig. 1. *Dimensions of expected impact created by the JPI Urban Programme (Source: JPI Urban Europe. SRIA 2.0)*
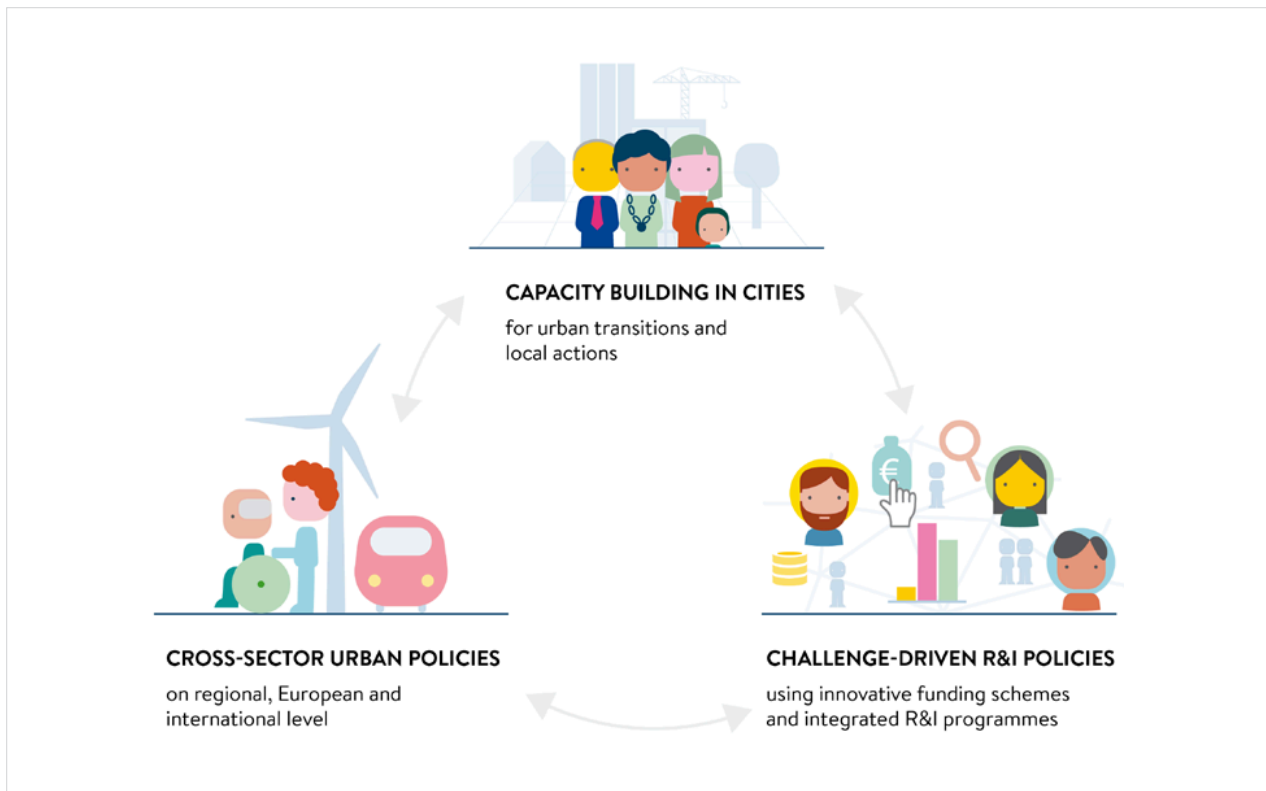
Methodology

In search for a stage for the co-creation and inclusive decision making among all players of all social and economic sectors of the society, the principle of "community sandbox" was implemented for bringing together the citizens' interest group and city administration for co-creation exercises and inclusive decision making (*Fig. 2*). The strategic development plan of Alytus was taken as a basis to spotlight main directions for urban transformation. The concept of Alytus city's strategic goals until 2030 (ACM, 2021) also includes tasks related to improving the efficiency of local self-government, the aim of which is to increase the efficiency of public services provided by the municipality and ensure the competences of specialists providing these services, improve the management of the municipality's activities, improving the management of the municipality and municipal institutions processes, to strengthen the positive image and communication of the city of Alytus, and to increase social capital and inclusion of residents.

Fig. 2. *The social system of the permanent urban living lab (Source: by authors)*
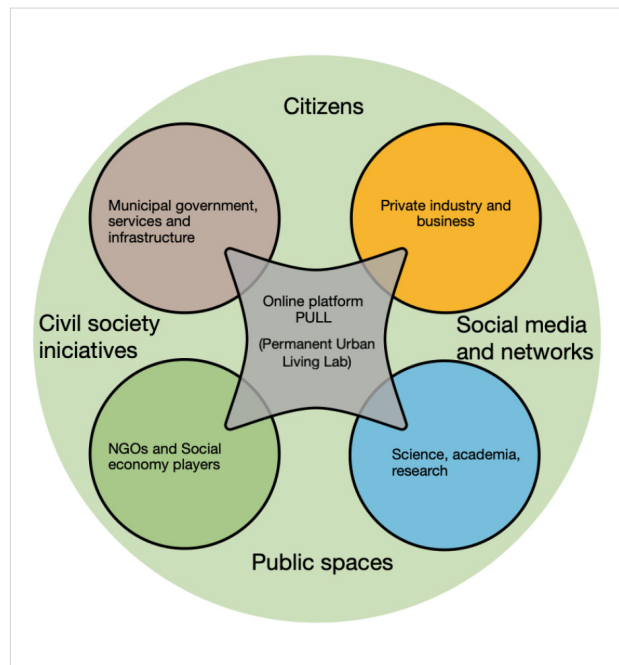
In this regard of collaborative governance, stakeholders work together to identify common goals, share information and resources, and jointly develop and implement solutions to address shared problems. This approach is based on the recognition that different stakeholders bring different perspectives, knowledge, and expertise to the table, and that working collaboratively can lead to more effective and sustainable outcomes. The success of collaborative governance depends on several factors, including trust and mutual respect between stakeholders, effective communication and information-sharing, and a willingness to compromise and find common ground. Examples of collaborative governance (Voets et al., 2021) initiatives include community-based natural resource management, multi-stakeholder initiatives to promote sustainable development, and public-private partnerships to deliver infrastructure projects, etc. Therefore, permanently cultivated models of stakeholders' communication enable the integration of diverse research and co-creation methods, fostering transformative capacity building for the future urban transformations.

As the goal, the initiative of bringing stakeholders together is to obtain the capacities for city future development, the urban living lab as a method for city transformative capacity building was considered as the most appropriate method serving for a constant communication and cooperation between community needs and decision-making authorities. Urban living labs (ULLs) are an innovative approach to urban development that involves collaboration among stakeholders such as city officials, citizens, and private entities to create a sustainable and liveable city (Concilio, 2016). In this context, Alytus, Lithuania, has adopted an ULL as a new method of urban transformative capacity building for local development.

Reviewing projects and good practices of the Urban Europe Programme (https://jpi-urbaneurope.eu/projects/) gives a comprehensive picture of how an ecosystem for co-governance could look like. The growing trend to involve citizens in city development, in order to make urban areas more adapted to citizens' needs is permanently expanding with every successfully implemented outcome of ongoing projects and the state of art benchmarks. This process was used in a series of meetings within Alytus community and involved a wide range of stakeholders, including citizens, companies, research, academia and the public sector representatives, which ensured the successful collaboration towards the shared solutions about Alytus urban transformations. ULLs are the orchestrators of this collaboration, bringing together the different stakeholders through co-creation https://municipalpower.org/best-practice-guides/guide1/), another method for shared governance.

Co-creation involves different phases of development and use of diverse methods to reach the final solution (see *Fig. 3*):

Phase 1 consists of a joint exploration to identify the challenges and the different needs from the perspectives of all stakeholders.

Phase 2 is the experimentation phase, which includes building a prototype of the proposed solution, testing it, and building it again, each time improving the solution based on the feedback gathered from the previous stages. In living labs, the place for experimentation is always a real-life setting: the solution is tested in the real-life environment, right where it is planned to be implemented.

Phase 3 of the co-creation process is evaluation and implementation. In this final phase, the solution is evaluated and the final version of it can be built (https://unalab.eu/en/urban-living-labs).

The PULL ecosystem (see *Fig. 4*) allows for a more adaptive and responsive approach to urban development, which can lead to more sustainable, inclusive, and resilient future of the city which uses such a method of co-creation.

The Alytus ULL is focused on three main areas of socio-economic collaboration: energy efficiency, circular economy, and citizen engagement. For example, the ULL has developed a program to retrofit buildings in the city with energy-efficient technologies, such as smart meters and insulation. The ULL has also implemented a circular economy project to promote waste reduction, reuse, and recycling. In addition, the ULL has organized various citizen engagement activities, such as participatory budgeting, to involve residents in decision-making processes.

Urban living labs (ULLs) can be an important way to approach multi-stakeholder co-creation with regard to urban transitions and transformations. They have become a common type of co-creative experimentation,

Fig. 3. *Methodological approach to PULL development*

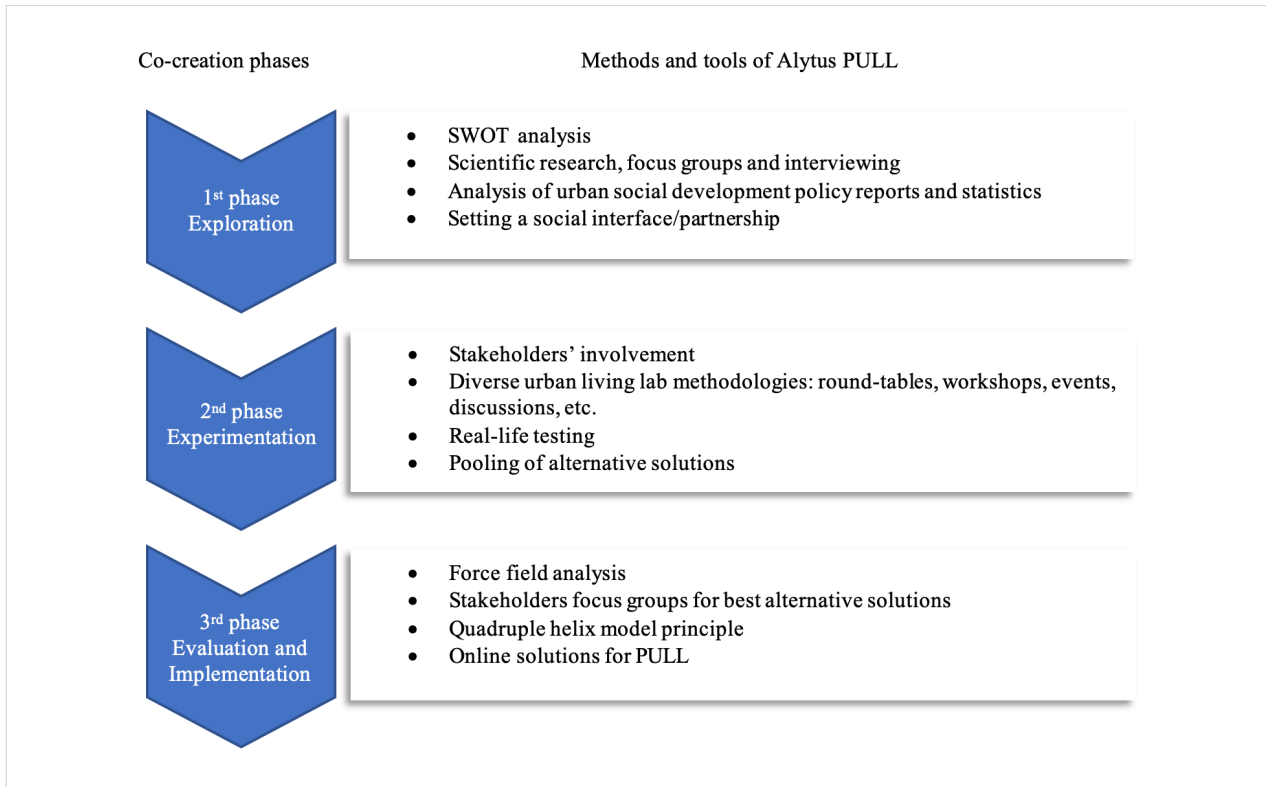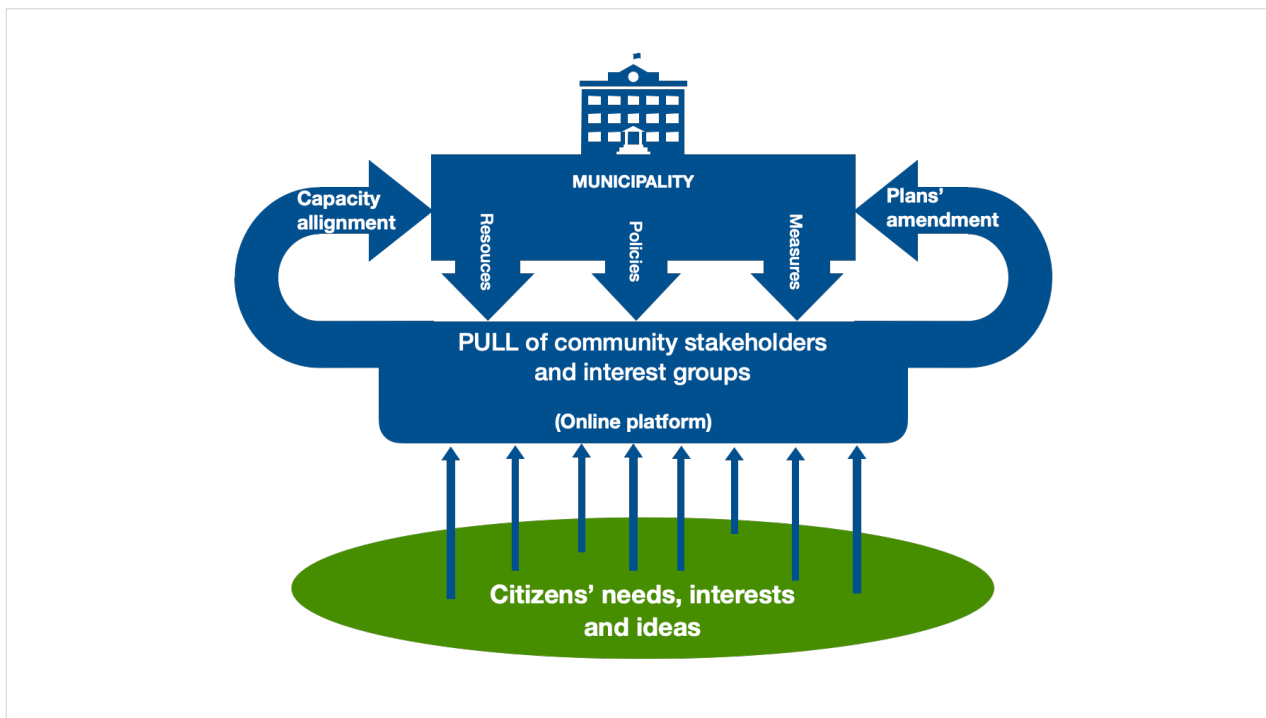| Co-creation phases	Methods and tools of Alytus PULL
1ˢᵗ phase Exploration	• SWOT analysis • Scientific research, focus groups and interviewing • Analysis of urban social development policy reports and statistics • Setting a social interface/partnership
2ⁿᵈ phase Experimentation	• Stakeholders' involvement • Diverse urban living lab methodologies: round-tables, workshops, events, discussions, etc. • Real-life testing • Pooling of alternative solutions
3ʳᵈ phase Evaluation and Implementation	• Force field analysis • Stakeholders focus groups for best alternative solutions • Quadruple helix model principle • Online solutions for PULL

Fig. 4. *Permanent urban living lab ecosystem (Source: by authors)*

offering the opportunity to research and innovate on a wide variety of challenges in everyday settings. They test hypotheses to create pathways for a transition to sustainable urbanisation (Bylund et al., 2023).

Here we discuss how user engagement and co-creation processes, which are essential components of the living lab methodology, can support the development of vulnerable communities. Specifically, the study explores the role of residents of Alytus (approx. 49 000 inhabitants) in this process and examine how user-led living labs (ULLs) can serve as effective tools for permanent participation through the digital (online) platforms.

While researching the involvement of community interest groups' into processes of decision making for urban transformations in the city of Alytus in the last decade, such methods of co-creation and co-design can be mentioned: focus group discussions and interviewing based on questionnaires and SWOT analysis, city forum, world-café and other methods of citizens' involvement into the process of co-governance. As a concentration for a generalized scope of methods applied for city discussions, the methods of force field analysis, quadruple helix model and urban living lab should be put into account. Force field analysis (FFA) is considered as a resumptive tool for defining and clarifying the conducive and restricting drivers for local development. According to Malmberg et al. (2017), even if there is no single living lab methodology, a few characteristics can be identified as the core of the methodology: multimethod approaches, user engagement, multi-stakeholder participation, a real-life setting, and co-creation. The living lab approach strives for mutually valued outcomes that are results of all stakeholders being actively engaged in the process from the very beginning. The characteristics are being defined as follows:

1 *User engagement.* This is rooted already in the origins of living labs. The key to success in any activity is to involve the users already at the beginning of the process.

2 *Multi-stakeholder participation.* Even if the focus is on users, involving all relevant stakeholders is of crucial importance. These include all the quadruple helix actors: representatives of public and private sector, academia and people.

3 *Real-life setting.* A very specific characteristic of living labs is that the activities take place in real-life settings to gain a thorough overview of the context.

4 *Co-creation.* Typically, especially in technology projects, activities are designed as top-down experiments, benefiting from users being involved as factors rather than actors. There is an increasing recognition that this needs to change so that users become equal contributors and co-creators rather than subjects of studies (Malmberg et al., 2017).

Following the results of an analysis of political documents, reports and statistics of urban and social development in Alytus, the method of force field analysis was employed as a prerequisite of urban stakeholders' involvement in social dialogue about the sustainable future of the city. Referring to Kuzior (2020), the top-down model and the bottom-up model are alternately combined to and related to social participation in city management, thus preferring the bottom-up model in the smart city and smart sustainable city design. The bottom-up model may work well in communities well-prepared for the city co-management. Hence, the important role is assigned to institutions that create, disseminate and distribute knowledge. The methodological approach to this topic also includes different critical analysis methods as a basis for the scientific research process. It applies deductive thinking, conceptual methods and scientific modelling that allows conceptualization and visualization of the presented subject. Analysis of scientific work already done in the field of urban development reveals the quadruple helix model as a consistent social interface for further considerations and design of urban living labs, which, according to the authors, is of key importance in the smart city and smart sustainable city design (Aleksandra, 2020).

Results and Discussion: Directing Urban Transformations through Force Field Analysis

Alytus is a city in Lithuania that has the potential to develop urban transformative capacities for a sustainable future. Considered potential areas of the focus are:

1 *Renewable energy.* Alytus has the potential to develop renewable energy sources such as solar, wind, and geothermal energy. By investing in these sources, the city can reduce its dependence on fossil fuels and decrease its carbon footprint.

2 *Sustainable transportation.* Alytus can develop sustainable transportation options such as cycling, walking, and public transport. This can reduce traffic congestion, air pollution, and greenhouse gas emissions.

3 *Green spaces.* Alytus can develop green spaces such as parks, gardens, and urban forests. These spaces can improve air quality, provide recreational opportunities, and enhance the city's overall liveability.

4 *Circular economy.* Alytus can adopt a circular economy approach that emphasizes resource efficiency, waste reduction, and the reuse of materials. This can create new economic opportunities while reducing environmental impacts.

5 *Sustainable food systems.* Alytus can develop sustainable food systems that prioritize local and organic food production, reduce food waste, and promote healthy eating habits. This can improve public health while reducing environmental impacts (Alytus Strategy 2030).

Through focusing on these areas and collating them with EU good practices for urban development, Alytus is developing urban transformative capacities for promotion of sustainability, resilience, and well-being. When it comes to directing urban transformations, a method of force field analysis was considered as highly effective, because the force field theory developed by Kurt Lewin (1951) suggests that human behavior is the result of the interaction between two types of forces: driving forces that encourage a particular behavior, and restraining forces that discourage it. According to Lewin, behavior will only change when the driving forces are stronger than the restraining forces, creating a "force field" that can be analyzed to understand the factors that impact behavior (Lewin, 1951). This approach involves identifying the driving and restraining forces that are affecting the urban environment, developing a strategy for addressing these forces, engaging stakeholders, and promoting sustainability. Mainly used in theoretical interpretations of social psychology, organizational psychology, and change management scientific research and applications, the force field analysis method has been explored in a variety of studies, such as in the context of urban planning and policy implementation (Okechukwu et al., 2020), understanding and managing driving and restraining forces in complex problem situations (Lawrence et al., 2018), and sustainable urban water management (Mavropoulos et al., 2019). To successfully implement this method, it is important to follow a few key steps. First, identify the problem or opportunity that needs to be addressed and gather data to help understand the driving and restraining forces involved. Next, develop a strategy that considers the key stakeholders, goals, and resources involved in the transformation. Once a municipal strategy has been developed, it is crucial to engage local stakeholders to build support for the plan and ensure that it aligns with the needs and priorities of the community. Promoting sustainability is also a critical aspect of directing urban transformations. This may involve incorporating green infrastructure, promoting sustainable transportation options, or designing buildings and public spaces that are energy-efficient and environmentally-friendly (Hollands, 2008). In this regard, the force field analysis (FFA) is considered as a tool to direct urban transformations by identifying and analyzing the forces that are driving or resisting change. The method involves examining the different factors that affect the urban environment, including economic, social, political, technological as well as consumer behavior factors. In search of the driving forces for transformative capacities for Alytus city, it was necessary to generalize and focus on some prominent and most concentrated vectors of city governance. In this case, it is relevant to rely on early studies of Olfert et al. (2011) on force field analysis in the context of regional economic development in the United States. In this work, the authors found that the most effective use of FFA involved identifying and prioritizing the most important driving and restraining forces, and then developing strategies to address these forces through policy changes, public-private partnerships, and other interventions (Olfert et al., 2011).

Overall, the FFA method provides a structured approach for directing Alytus' urban transformations by identifying and analyzing the different forces that are driving or resisting change in the urban environment. By developing a city strategy based on this analysis and citizens' involvement in the decision making process, urban planners and policymakers can take a more informed and targeted approach to addressing the challenges and opportunities facing their communities. After analysis of a city strategy for 2030 (Alytus strategy 2030) and after revision of completed full SWOT analysis, some major threats and opportunities from presented SWOT analysis were taken for identification of the driving and restraining forces that are impacting the urban environment (see *Table 1*).

Table 1. *Major threats and opportunities for Alytus (Source: Alytus strategy 2030)*

Threats	Opportunities
Lack of cooperation between business, municipality and non-governmental organizations.	Public activity is growing in order to participate in transparent state political processes.
Low funding of NGOs from the municipality, lack of cooperation.	The openness of public sector institutions is increasing.
There is no public sector electronic document management system in place.	There is a growing need to transfer part of public services to non-governmental organizations (NGOs) and communities.
Lack of clarity of information presentation, communication of decisions.	A unified strategic planning system (it is not clear what it is, but maybe it can be proposed as a visionary one).
There is no clear strategy and vision; therefore, there is no purposeful positioning and communication of the city.	Various forms of communication are being developed using modern technologies, and their diversity is increasing.

Force field analysis (FFA) requires identifying and analyzing the forces that are driving or hindering change in achieving goals of urban development. In the context of Alytus city governance, here are some possible force field analysis elements based on opportunities and threats derived from city strategy (Alytus strategy 2030).

Driving forces (DF) are the factors that are pushing for change or driving the city towards a particular goal:

DF1. Growing awareness of the need for sustainable development and environmental protection;

DF2. Increasing public demand for transparency, participation, and accountability in decision-making;

DF3. Emergence of new technologies and innovative solutions for urban challenges;

DF4. Availability of funding and resources from national and international sources;

DF5. Strong political leadership (around next elections) and commitment to change.

Restraining forces (RF) are the factors that are hindering or resisting change or progress in the city:

RF1. Lack of public awareness and engagement on important issues;

RF2. Inadequate capacity and skills within the government and civil society to lead and participate in change processes;

RF3. Bureaucratic obstacles and legal frameworks that constrain innovation and experimentation;

RF4. Limited/insufficient financial and human resources for implementing new initiatives;

RF5. Resistance to change from vested interests, such as business or political groups.

It is important to note that the driving and restraining forces can vary depending on the specific context and situation in Alytus. To conduct the FFA effectively, it is necessary to engage with a wide range of stakeholders to identify and prioritize the most important factors affecting change. Based on results of this analysis, city governance leaders can then develop strategies to amplify the driving forces and mitigate or overcome the restraining forces, in order to achieve their short-term goals and set directions for future goals.

Following works of Etzkowitz and Leydesdorff (2000), Carayannis and Campbell (2009), and Carayannis and Rakhmatullin (2014), the *quadruple helix model* was also taken into scope of co-creation methods in this research, where it described as a framework that describes the relationships between four key stakeholders: academia, industry, government, and society. The model is based on the idea that when these stakeholders work together, they can create a more innovative and sustainable economy. This form of co-working interaction then serves as a *social interface* between decision making social system and the rest of citizens and society in large. The interface involved, consists of certain players, having a certain role in city development. *Academia* represents universities, research institutions, and other knowledge-generating organizations. This helix contributes to the development of new knowledge, technologies, and ideas (Carayannis et al., 2009). *Government* represents policymakers, regulators, and other decision-makers who shape the environment for innovation. This helix contributes to the creation of supportive policies, funding, and infrastructure (Carayannis et al., 2014). *Industry* represents

businesses, entrepreneurs, and other organizations that bring ideas to the market. This helix contributes to the commercialization of new technologies and ideas (Etzkowitz et al., 2000). *Society* represents citizens, civil society organizations, and other groups who use and benefit from innovation. This helix contributes to the social and economic impact of innovation.

The quadruple helix model emphasizes the importance of collaboration and co-creation between these four sectors, with the aim of fostering innovation that is both socially and environmentally responsible, as well as economically viable. By involving a diverse range of stakeholders in the innovation process, the quadruple helix model serves as the interface to interact with city's social systems for creation of more inclusive and sustainable innovation ecosystems.

As it is seen from FFA *power force* distribution (*Fig. 5*), the increase of public demand for transparency, participation, and accountability in decision-making as a *driving force* DF1 are not sufficient compared to *restraining forces* (RF1) of the lack of public awareness and engagement on important issues, which show a potential of *public awareness and engagement* as the first transformational capacity (TC1). From the second power play, we can see that the driving force of the growing awareness of the need for sustainable development and environmental protection (*driving force* DF2) is restrained by the inadequate capacity and skills within the government and civil society to lead and participate in change processes (*restraining force* RF2), which shows the *demand of communication* between city administration and all local groups of interest as a second transformational capacity (TC2). Following the power play between *driving force* DF3 and *restraining force* RF3 shows that the sufficient emergence of new technologies and innovative solutions for urban challenges is significantly hindered by bureaucratic obstacles and legal frameworks that constrain innovation

Fig. 5. *Driving and restraining forces in urban transformations (Source: by authors)*
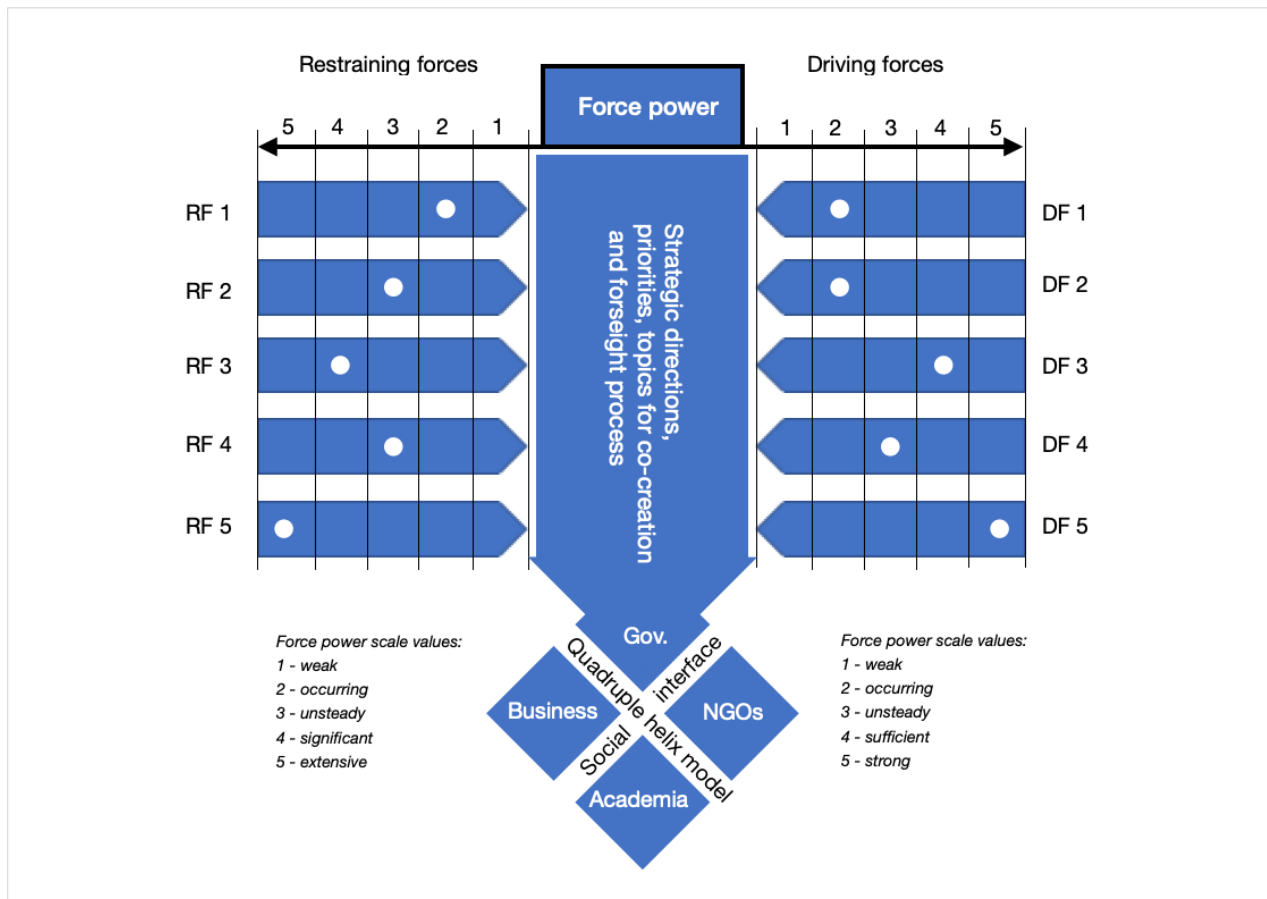
and experimentation, which leads to the third transformational capacity of *transparent and simplified legal procedures* for innovative proposals (TC3). Analysis of the fourth power play shows that availability of funding and resources from national and international sources (*driving force* DF4) is unsteady because of limited or insufficient financial and human resources for implementing new initiatives, which leads to fourth transformational capacity of *tangible and politically independent financing schemes* for a new initiative dedicated

to urban development (TC4). And finally, the fifth power play shows that the extensive resistance to change from vested interests, such as business or political groups (*driving force* DF5) collides with strong political leadership (around next elections) and commitment to change (*restraining force* RF5), which leads to the fifth transformative capacity of *permanent model for co-creation* (TC5). And this directly corresponds to the method of *permanent urban living lab (PULL)* presented earlier in this text.

Conclusions

The PULL method has several benefits for urban transformative capacity building for local development. First, it allows for a more collaborative and participatory approach to urban planning and development, which can lead to more inclusive and equitable outcomes. Second, it creates a space for experimentation and innovation, which leads to more sustainable and resilient solutions. Third, it promotes learning and knowledge sharing among stakeholders, which leads to more informed and evidence-based decision-making. The PULL method also creates a sense of ownership and accountability among stakeholders, which is crucial for ensuring the success of local development initiatives. This involves stakeholders to build a strong platform for permanent communication and feedback, support initiatives, addressing regulatory or legal barriers for innovative actions, increasing public awareness and education about the benefits of certain policies, and securing additional funding or resources to support city initiatives. This study confirms the hypothesis that *enabled integration of diverse research and co-creation methods for revealing transformative capacities for the future development of the city* gives a permanent and tangible method for involvement of community interest groups' in urban development activities independent

from political and bureaucratic dominance. Overall, the method of PULL has enabled Alytus to reveal and elaborate its transformative capacities, such as: *a) public awareness and engagement, b) the demand of circular communication channels, c) setting transparent and simplified legal procedures, d) building tangible and politically independent financing schemes and d) permanent model for co-creation.*

Considering possible future methodological improvements built on the case of Alytus urban living lab's achievements, the digital platform and mobile application of PULL can be taken into account. This analysis shows and opens the perspective for creative businesses, social innovations and social economy start-ups to be involved in the process of co-creation. In conclusion, the permanent urban living lab in Alytus, Lithuania, has been considered as an effective method to urban development that has the potential to create sustainable and liveable place for local community to thrive.

Acknowledgements

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