

Serious Game and Serious Play Concepts in the Content Analysis of Urban Spaces

Jurga Vitkuvienė, Indrė Gražulevičiūtė-Vileniškė, Kęstutis Zaleckis, Brigita Tranavičiūtė,
Kaunas University of Technology, Kaunas, Lithuania

Abstract – The article demonstrates the development and application of activities with serious play and serious game features for the facilitated process of content analysis of images of urban public spaces. The study involves accumulation of the material for the analysis, develops the coding categories and their visual representations – pictograms, analyzes and groups the images and attributes the pictograms to them, marks the insight on the sticky notes, develops the matrixes of functioning of urban spaces, and discusses the outcomes. The developed set of activities based on the hands-on approach can be used in research and studies and could be adapted to local community-based activities.

Keywords – Content analysis, hands-on approach, public urban spaces, serious game, serious play.

INTRODUCTION

The increased interest in games and gamification in the fields other than entertainment can be witnessed since 2002. This interest is reflected in the considerable number of developed games, the multiplication of events on the subject, a wide range of areas of application [1], and the number of recent research papers on the subject. Different terms – game-based learning [2], serious game [1]–[5], applied game [6], serious play [7]–[9] – are used in this context. A serious game can be defined as a game that is designed for a primary purpose other than pure entertainment, it can be education, training and even research. According to Mouaheb et al., the concept of serious game is a vast field that is not limited to training and may in particular be used for other educational purposes. The characteristic features of this concept are means of entertainment, information technology and communication, it targets multiple learning objectives, it applies in almost any field, and it is for all ages [1]. Meanwhile the term serious play refers to an array of playful inquiry and innovation methods that serve as vehicles for complex problem-solving, typically in work-related contexts. The majority of the serious play activities that lead to innovations in various fields is increasingly linked to experiments with models, prototypes, and simulations [9]. The analysis of literature demonstrates that serious game is more structured approach compared to serious play, and serious games are often viewed in computer-based context [1]–[5]; however, hands-on approach characteristic to design thinking [10] and other similar methods can be integrated into serious game design as well, as it was demonstrated by this research. According to Giessen, the concept and activities of gaming, as well as their benefits, are not clearly defined [4], however, game and play based methods of teaching, learning and development of ideas are becoming more and more widespread in different levels of study and educa-

tion as well as in industry. There is an increasing awareness that the learning content and working challenges should be transmitted in a somewhat pleasant and attractive way that evokes interest and positive emotions but not stress and boredom.

This article is a case study that presents the activities, that can be referred to as serious play and serious game, which were developed within the frame of the study of modernization of the large Lithuanian cities as a tool to view and represent modernist and modernized urban spaces through the documented activities of the particular space users in the course of time [11]. The article has the following aims:

- to demonstrate, how the playing and more structured gaming features and the aspects of design thinking can be integrated into scientific research;
- to present the set of activities with serious play and serious game features that can be used in the content analysis of the images of urban spaces by researchers, students, professionals and communities;
- to show the research results, that were obtained using this approach.

The methods of the research involved content analysis of images of urban spaces – general overview, identification of coding categories in the images – brainstorming activities of the research team members, development of tools and framework for the serious game activities and testing them in the research process and with the group of master students in the frame of Urban Sociology course.

I. METHODOLOGY

The content analysis method was selected as a tool for the analysis of the phenomena of functioning and uses of public spaces before and during the Soviet period and nowadays in the study of modernization of large Lithuanian cities – Kaunas, Vilnius, and Klaipėda [11]. In the course of the study a significant volume of visual material was accumulated, including historical and contemporary photographs, postcards, images from newspapers, books and other media reflecting public urban spaces of different types in three historical periods: inter-war, Soviet, and contemporary (Table I).

First, general overview of the material in digital form was carried out and further analysis and coding of the images was done using content analysis software *Atlas.ti*. Three groups of coding categories were distinguished: types of public spaces, types of their users, and types of activities taking place there. These groups of coding categories were formulated based on

TABLE I. DISTRIBUTION OF VISUAL MATERIAL ACCUMULATED DURING THE STUDY [12]

Cities under analysis	Number of accumulated units of visual material		
	Inter-war era	Soviet period	Contemporary (around 2016)
Kaunas	234	909	713
Vilnius	253	968	300
Klaipėda	125	411	200

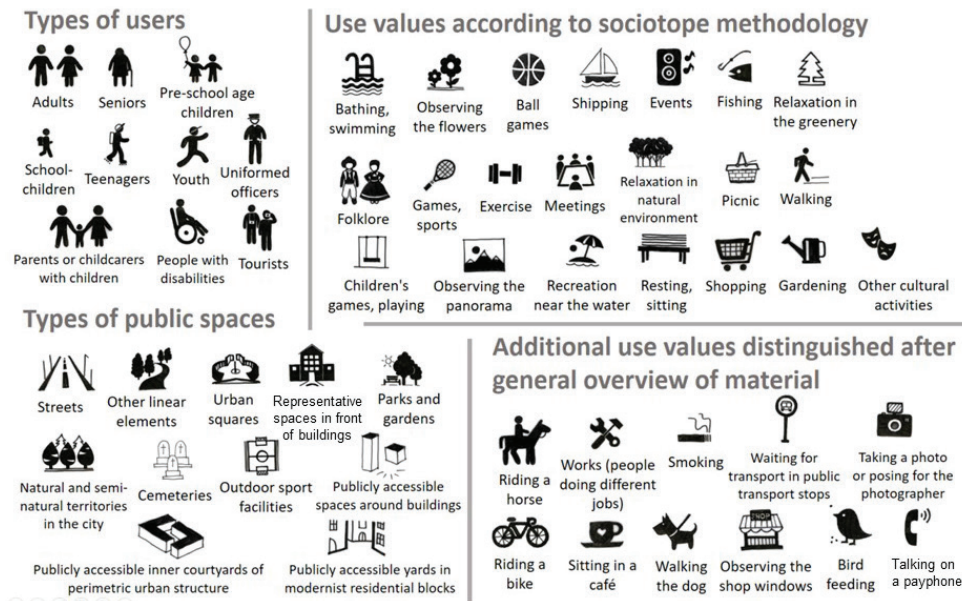


Fig. 1. Coding categories [13]–[15] applied in the study and corresponding pictograms.

the analysis of literature [13], [14], an overview of the images and the sociotope methodology [15] and can be seen in Fig. 1. The sociotope methodology [15] is an approach that applies the concept of ecosystem to the social functioning of spaces and analyses territorial distribution of uses of public spaces. The classification of uses characteristic to sociotope methodology was integrated into developed coding categories; the categories defined within the sociotope methodology were used to identify the types of activities taking place in public spaces. The application of content analysis software allowed generating quantitative results that were applied in the further steps of the study and general qualitative conclusions [16]. However, for the finalization of the research deeper qualitative insights were necessary on how interaction between urban spaces, their users and the activities of these users evolved and changed in the periods under analysis. Thus, we have initially decided to apply the hands-on approach characteristic to design thinking method [10]. Considering that in this qualitative analysis the main attention is devoted to the case of Kaunas [11], we have decided to print the accumulated images of Kaunas and to get the additional insights by grouping them, comparing and clipping on boards or maps in the brainstorming activities. The images of Vilnius and Klaipėda were overviewed

in the digital form. After the brainstorming activities, we have developed a sequence of steps (the process is documented in Fig. 2) that can be employed in the content analysis of images of urban spaces:

- The images of selected urban spaces in the periods of time under analysis were collated. The volume of the images used in this study is described above. The images can be printed; however, if the printing of large volume of images is not reasonable, the images can be analyzed in a digital form, directly from books, journals or their original sources.
- The visual representations of the coding categories used in the analysis were developed. In this case, we used the typology of users, typology of public spaces and typology of activities that can take place in the public spaces. These coding categories are targeted for the understanding of the functioning of public spaces; however, additional categories, including seasons, time of day, etc. could be added. Each type of user, space and activity were assigned a simplified pictogram symbolizing it. All the pictograms that we have developed in the course of this study can be seen in Fig. 1.

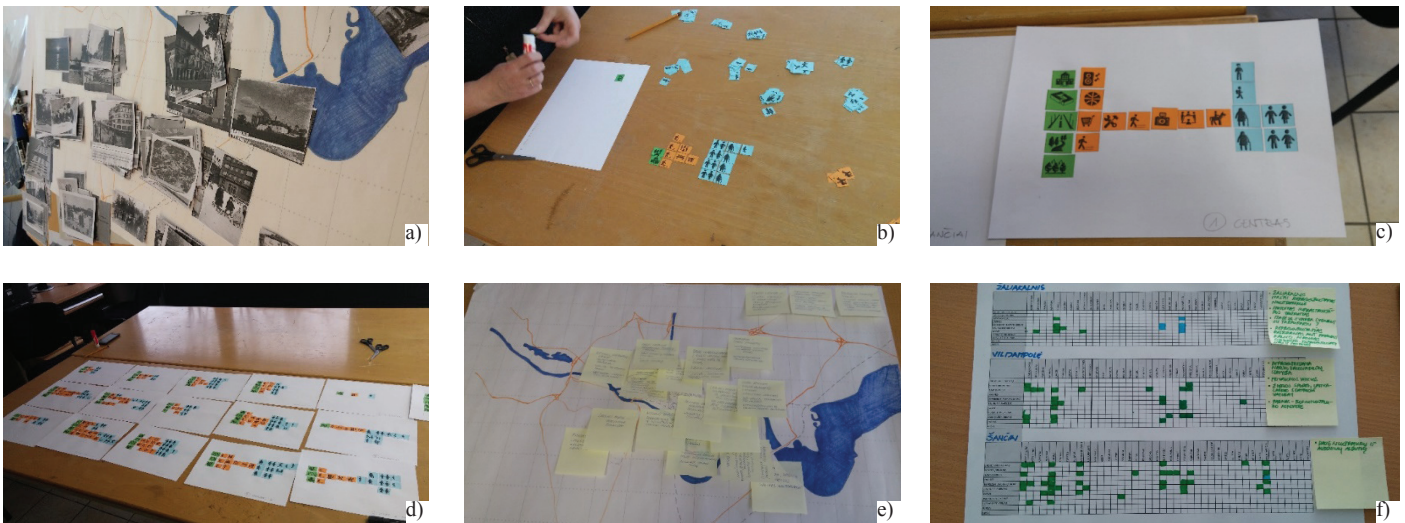


Fig. 2. The activities with the features of serious play and serious game in the process of content analysis of images of public spaces: a – analyses and grouping of images; b – using pictograms as visual representation of coding categories; c – hands-on approach in developing the matrixes of interaction of public spaces, users and activities; d – comparison of the developed matrixes; e – insights generated in the process written on the sticky notes attached to the map; f – printed matrixes of the interaction of spaces, users, and activities used for the analysis of images in the digital format [Figures: I. Gražulevičiūtė-Vileniškė].

- Analyzing and grouping the images (for example, images can be grouped according to the district, street, square, etc. they represent) (Fig. 2 a) and attributing the pictograms representing identified types of spaces, users, and activities to individual images or groups of images was carried out.
- While analyzing and grouping the images, the insights about the functioning and uses of public spaces can be generated. These can be marked on sticky notes and attached to the map in the location of the spaces under analysis (Fig. 2 e).
- The matrixes of interaction of spaces, users and activities were developed. The matrixes can be made using hands-on approach by gluing the pictograms on paper (Fig. 2 b, 2 c, 2 d); if the images are analyzed in the digital format, the printed matrixes of spaces, activities and users can be prepared and colored in the process (Fig. 2 f).
- The developed matrixes were analyzed and the conclusions on the functioning of public spaces were generated.

II. RESULTS

The results generated by this case study are twofold: the developed and tested set of activities and tools can be applied in the research and study process, potentially adapted for the work with communities and the additional insights about the functioning of public spaces generated for the above-mentioned research project.

Application in the study process. This set of activities was tested with the group of Master of Architecture students in the frame of Urban Sociology course (Fig. 3). Students analyzed two historic neighborhoods of Kaunas – Old Town and Šančiai. For the workshop, students were provided with sets of photographs in a digital form as well as some printed material rep-

resenting the neighborhoods under analysis in three historical periods: inter-war, Soviet, and contemporary. In the course of activities, the students developed three matrixes for each neighborhood and, based on them, discussed the features and trends of functioning of public spaces in the neighborhoods in the course of time: how the features of spaces had changed; how the typology of users changed; how the array of activities in public spaces had changed. After the discussion students had concluded that this set of activities with serious game features had given them additional insights about the development and actual functioning of the neighborhoods; however, they identified the dependence of the results on the set of available photographs as the shortcoming of the method.

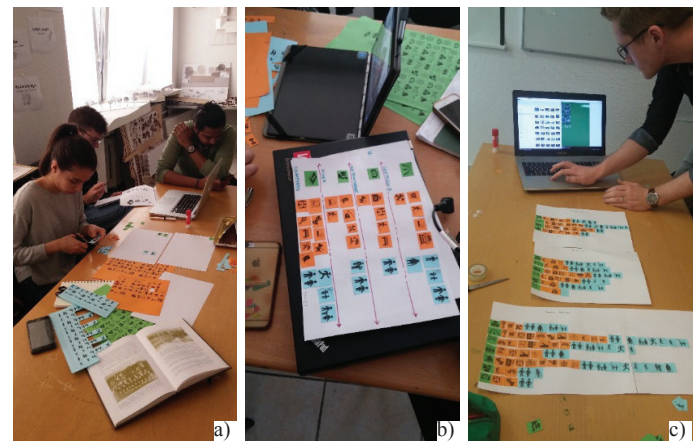


Fig. 3. Testing the set of activities with the group of students: a – analyzing images and preparing pictograms for the development of matrixes; b – one of the matrixes developed by the students during the lecture; c – comparison of matrixes, reflecting the dynamics of public spaces in the course of time [Figures: I. Gražulevičiūtė-Vileniškė].

After the evaluation of process and outcomes of testing the developed set of activities and tools in the study process, the following benefits were identified:

- In the context of contemporary pace of life, the lack of concentration of attention is often identified as a challenge in the study process. The slow-pace hands-on activities allow to view the research data or problem in a steadier and more concentrated way, to generate new insights, to find new qualitative characteristics and links. The process that involves students and provokes discussions usually has added value in the process of education.
- The tested approach towards the content analysis of the images of public urban spaces allowed students to develop more personal and emotional links with the site under analysis. This is important as a motivating factor in the education process.
- The grouping of data and the visualization of findings in the course of work with the large volume of multilayered information allow keeping better with the work plan and leaving wide possibilities for interpretation, insights and generalizations at the same time, as visual perception is more holistic.
- The results of work formulated and presented in this way are visual and legible and allow the abstraction of the most relevant characteristics of objects or phenomena under analysis.

Application in the research process. After developing and testing the sequence of steps for the analyzing the images and generating the matrixes of functioning of urban spaces, we had applied this methodology for the analysis of the images of Kaunas, Vilnius and Klaipėda of the three historical periods. As it was mentioned above, the main attention was devoted to Kaunas. The matrixes of users and activities in different types of public spaces were developed by hand (Fig. 2d) and then digitally redrawn for publication. Some of the matrixes together with the general conclusions formulated after the analysis are presented below. The first column from the right in dark grey color represents the types of public spaces in which the activities occur, the second column in light grey color represents the types of activities or uses in each space, and the last column represents the types of users of the space in all the matrixes (Figs. 4–6).

Summarizing the results of the content analysis of the images of the Inter-War period, it can be stated that public spaces could be characterized as partially orientated to people. The structure of urban spaces had an acceptable human scale and much information was provided at “the eye level”. However, there is a lack of optional activities and recreational infrastructure observed in the images. The relatively narrow array of activities and the dominance of necessary activities can be seen in the matrixes of functioning of spaces of the Inter-War era in Fig. 4 – Fig. 6. The distinction between the necessary (functional) and optional (recreational) activities is very important for our research, defining the everyday uses and social nature of urban spaces. Depending on the type of activity that dominates in the space, it is partly possible to predict and evaluate its quality.

Usually necessary activities take place in space regardless of its physical parameters. Meanwhile, optional activities are sensitive to the aesthetic, functional characteristics of space [17]. Necessary activities dominate in the analyzed images of the public spaces of Inter-War era. Concentration of activities and variety of optional activities are observed only in the images of local areas of the city, which were usually located nearby the main streets, but not in them. The phenomenon of living between buildings [17] is very poorly captured in the Inter-War photographs.

The analysis of the images of public spaces of the Soviet period demonstrates that although the structure and scale of the spaces have become much less humane, the number of public spaces was gradually increasing and they became more diverse and widespread in the city. The increased diversity of typology of spaces can be seen in the matrixes in the Fig. 6. As it can be seen in the matrixes (Fig. 4 – Fig. 6), there is a clear increase in the optional activities in public spaces and new phenomena of social activity were captured in the analyzed images. In general, social activity in public urban spaces (especially in the central and recreational areas of the city) is significantly higher. During the late Soviet period, certain patterns of life between buildings can be observed. Although quite interesting social activities were recorded in the inner courtyards of the old towns not only in Vilnius but also in other investigated cities, it is noticeable that the recorded use of the spaces between the buildings in the new modernist districts is very low. In newly built modernistic residential areas residents are recorded using only the central part of the inner courtyard of the apartment buildings, which is usually equipped with a playground. Other spaces between freestanding buildings usually are depicted empty or demonstrate the transit character. During this period, the system of urban public spaces has undergone tremendous structural changes that, due to their scale, have not been fully implemented. While public spaces of city centers have gradually been improved, meanwhile the lack of human scale, local greenery and recreational infrastructure has reduced the potential use of local public spaces.

Summarizing the results of the analysis of contemporary images, it can be stated that the number and variety of optional activities in cities increased dramatically during this period (especially in the last few years). Life between buildings takes on new forms during this period. These include not only traditional games or leisure activities, but also social events, promotions, local art installations and so on. However, the analyzed images reveal that contemporary cities have a relatively low level of social activity in the yards of modernist apartment buildings as well (Fig. 6); most probably due to the lack of infrastructure, in some cases it is even more lacking than in the Soviet period. As it is well reflected in the developed matrixes, people prefer to spend their time in well-equipped urban public spaces and urban green spaces. However, despite the slow evolution of contemporary public spaces in Lithuanian cities, it can be stated that in recent decades it has been going on quite consistently and modernist urban structures have been transformed gradually. This is demonstrated by some newly emerging, localized, small-scale structures and objects in the infrastructure of public spaces, that complement

Laisvės Avenue

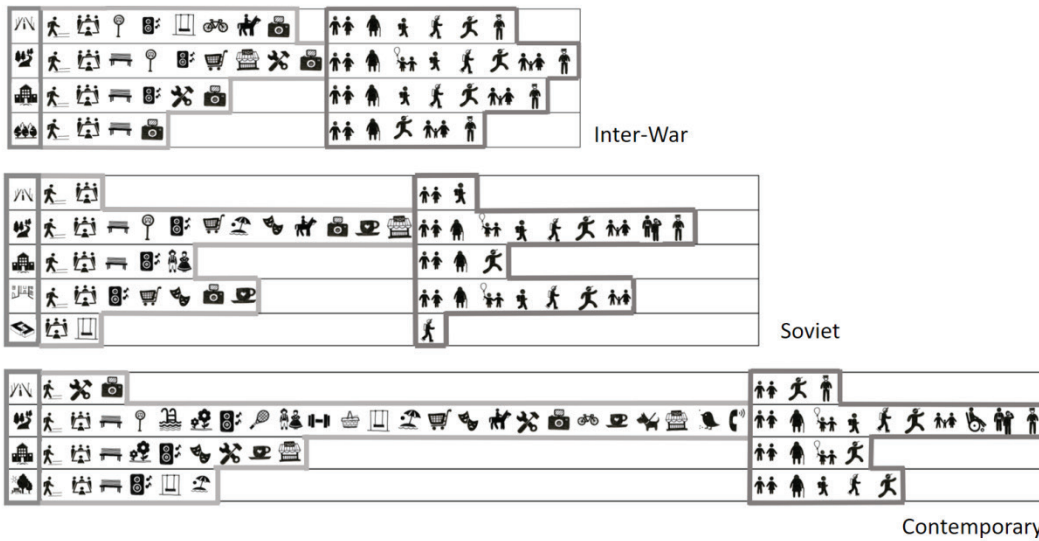


Fig. 4. The matrixes of functioning of Laisvės Avenue in the analyzed historical periods. Inter-War: the main street of Kaunas city can be characterized by a functional and transit character of activities. Soviet: more recreational character can be seen in the images of Laisvės Avenue of this period. Laisvės Avenue seems extremely populated during the events, such as fairs. Contemporary: Laisvės Avenue can be characterized with the vast diversity of activities including sports and users [Figure: by the authors].

Vienybės Square

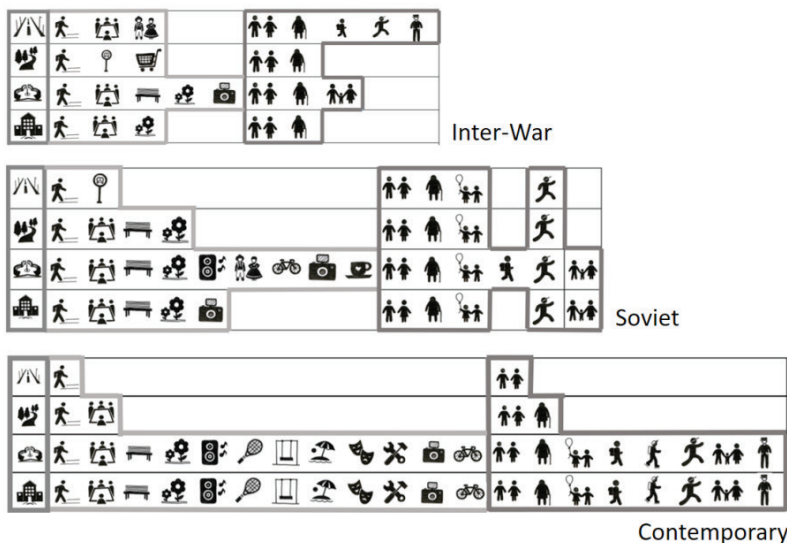


Fig. 5. The matrixes of functioning of Vienybės Square in the analyzed historical periods. Interwar: Vienybės Square is distinctive in the context of other urban squares in Kaunas with its representative character, decorativeness, diversity of users and recreational activities. Soviet: Vienybės Square had maintained the representational character, which was complemented by the Soviet symbols in this period. The activities characteristic to this type of space like relaxation on the benches, observing the flowers, meeting, walking with children, taking photographs in front of monuments are recorded in the images. Various events of official representative character were held in this space as well. Contemporary: a wide array of activities including sports and diversity of users are recorded in the images of this space [Figure: by the authors].

and correct the shortcomings of previously created urban infrastructure. This is a good sign of the sustainable development and self-healing of the urban fabric.

CONCLUSIONS

The research has demonstrated that hands-on approach and the activities with the features of serious play and serious game

can be successfully integrated into research and study processes. The developed set of activities encompass: the accumulation of the material for the analysis, developing the coding categories and their visual representations – pictograms, analyzing and grouping the images and attributing the pictograms to them, marking the insight on the sticky notes, developing the matrixes of functioning of urban spaces, discussing the outcomes. The images can be analyzed and matrixes can be drawn in a digital form;

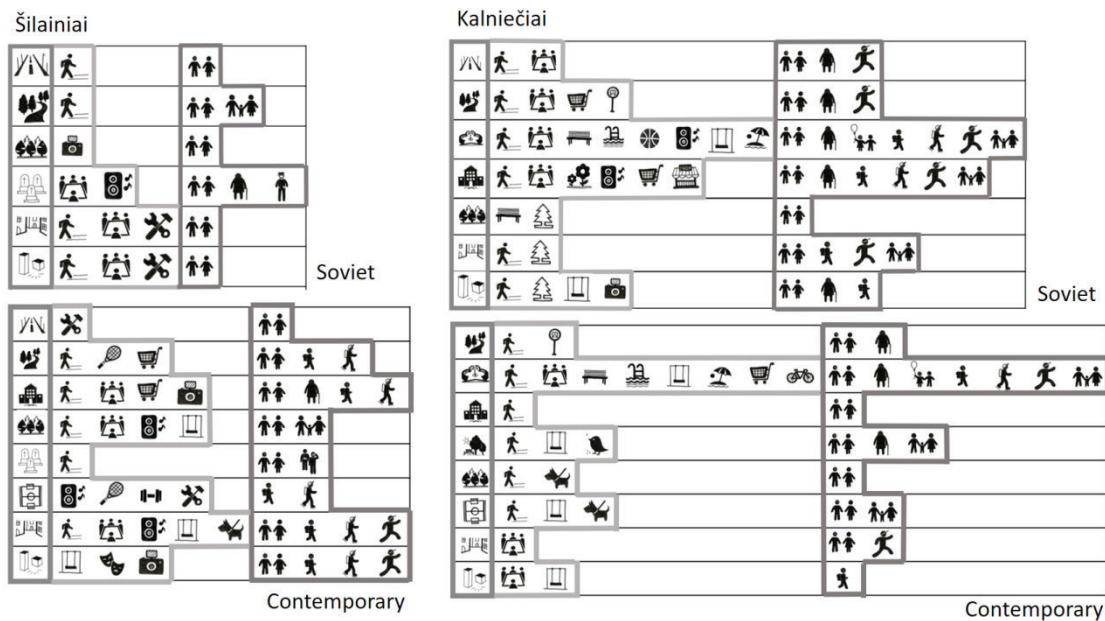


Fig. 6. The matrixes of functioning of Šilainiai and Kalniečiai modernist districts in the analyzed historical periods. Soviet: the analyzed images demonstrate the significance of Kalniečiai district. Although numerous images depict the district from the main streets and show the spaces in front of the public buildings, there is a lack of images showing the life in the spaces between the apartment buildings. The diversity of users and activities is quite high in Kalniečiai district. Čečėnijos Square with large fountain in Kalniečiai seems important attraction point with high diversity of users and activities. Šilainiai district was built at the end of the Soviet period. The collected images from newspapers show scarcely populated newly developed large spaces between buildings. Contemporary: the modernist residential districts are much less represented in the images compared to the Soviet period. The array of activities varies from one district to another, although the public spaces in these districts appear quite empty. The concentration of activities can be seen in Čečėnijos Square in Kalniečiai [Figure: by the authors].

however, for the study process or, potentially, for the work with communities, the hands-on approach with the printed material is recommended.

The matrixes of functioning of urban spaces in different historical periods developed in the course of the content analysis of the images allowed to generate additional insights and complement the findings of general overview of the images. For example, the matrixes visually depict the balance of necessary and optional activities, the diversity of users and spaces, which were very important for the study.

Summarizing the study, it can be concluded that the impact of modernization of urban areas was gradual. In the Inter-War period, modernization was more evident in the new activities that took place in the traditional urban space. Although necessary functions are prevalent in public spaces, optional and previously unconventional activities, are increasingly seen in the photographs. During the Soviet period, the diversity of activities and their massiveness have been increasing, especially in the recreational areas or in their access. Territorial differentiation of functions inherent in modernism determines that different activities in the city were distributed unevenly. City centers and parks, access to water bodies, quays, public neighborhood centers and their squares, where the greatest variety of optional activities and space users are concentrated, are distinguished by their recreational potential. Meanwhile, in the so-called 'sleeping districts' the variety of activities is much poorer, with more or less compulsory or casual character of activities. Publicly available

sources have rarely captured images of internal yards and their users in the modernist neighborhoods. The contemporary period can be characterized with the significant increase in number and variety of optional activities and the activities seem less dependent of the character of the space (for example sports in the representative square), however the public spaces in the city center remain the most popular and the most intensively used.

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Jurga Vitkuvienė (b. Kaunas, 1976) received the degree of Bachelor of Architecture in 1998 and the degree of Master of Architecture in 2000. LECTURER at Kaunas University of Technology, Faculty of Civil Engineering and Architecture since 2005.

Current and previous research interests: urban history, management of rural-urban interface, urban ecology, sustainable landscape and architecture.



Indrė Gražulevičiūtė-Vileniškė (b. Kaunas, 1981) Bachelor of Architecture, 2003, Master of Land Management, 2005, Doctor of technological sciences, 2009, Kaunas University of Technology.

LECTURER at Kaunas University of Technology, Faculty of Civil Engineering and Architecture, Department of Architecture and Land Management 2009–2012,

ASSOCIATED PROFESSOR at Kaunas University of Technology, Faculty of Civil Engineering and Architecture since 2012.

Current and previous research interests: valuation and preservation of cultural heritage, management of rural-urban interface, sustainable architecture.



Kęstutis Zaleckis (b. Kaunas, 1969) Architect, 1992, Vilnius Gediminas Technical University; Doctor of Humanities, 2002, Vytautas Magnus University/Institute of Architecture and Construction. PROFESSOR at Kaunas University of Technology, Faculty of Civil Engineering and Architecture.

Current and previous research interests: evolution and mutations of urban spatial genotypes, urban history.



Brigita Tranavičiūtė (b. Kaunas, 1985) Bachelor of History, 2007, Master of Law, 2010, Doctor of Humanities, 2015, Vytautas Magnus University.

Junior researcher at Kaunas University of Technology, Institute of Architecture and Construction since 2016.

Current and previous research interests: Soviet architecture and urbanism, Soviet economics and trade, post-Soviet economics and trade.

CONTACT DATA

Jurga Vitkuvienė

Kaunas University of Technology, Faculty of Civil Engineering and Architecture
Address: Kaunas University of Technology, Faculty of Civil Engineering and Architecture, 48 Studentu St., LT-51367 Kaunas, Lithuania
Phone: +370 37 451546
E-mail: jurga.vitkuviene@ktu.lt

Indrė Gražulevičiūtė-Vileniškė

Kaunas University of Technology, Faculty of Civil Engineering and Architecture
Address: Kaunas University of Technology, Faculty of Civil Engineering and Architecture, 48 Studentu St., LT-51367 Kaunas, Lithuania
Phone: +370 37 451546
E-mail: indre.grazuleviciute@ktu.lt

Kęstutis Zaleckis

Kaunas University of Technology, Faculty of Civil Engineering and Architecture
Address: Kaunas University of Technology, Faculty of Civil Engineering and Architecture, 48 Studentu St., LT-51367 Kaunas, Lithuania
Phone: +370 37 451546
E-mail: kestutis.zaleckis@ktu.lt

Brigita Tranavičiūtė

Kaunas University of Technology, Institute of Architecture and Construction.
Address: Kaunas University of Technology, Institute of Architecture and Construction, 60 Tunelio St. Kaunas, Lithuania.
E-mail: brigita.tranaviciute@ktu.lt