**Original Research Article** 

# Participation: The Basis of Designing Multifunctional Urban Spaces\*

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Abstract | The idea of designing a multifunctional urban space in different forms and with various meanings has always been existed in the field of architecture and the urban design, but the comprehensive definition of this concept is still missing. Although these types of urban spaces have always been elaborated spontaneously in developing countries, in developed countries, there are more restrictions for using urban spaces. Despite the differences in the ownership of public spaces, multifunctional spaces have emerged around the world and are increasing day by day. These spaces differ according to the context in which they are formed, the characteristics related to the morphology of the space and its dimensions and sizes, as well as their primary function. Beside these differences, they maintain common patterns that will help urban actors plan and design for such spaces in the future.

This article analyses 80 examples of spaces that are currently multifunctional or demonstrate the potential to become one. In this research, the case-based reasoning (CBR) method has been employed along with the pattern language of Christopher Alexander to select the criteria and extract patterns. The result represents principles that can help designers to be more effective in enhancing the quality of life of citizens. Finally, it is observed that the obtained patterns have less physical form and mostly involve space planning and management. The pattern that has the most repetition among the extracted patterns is "participation", which should be considered as a culture in all its forms from the beginning in the process of planning, design and management.

Keywords | Multifunctional space, Urban space, Urban management, Participation, Pattern.

Introduction | In recent years, city planners have introduced the concept of multifunctional or mixeduse land use as a new concept, which can be defined as the antonym to the modernist concept of zoning. Multifunctional land use can be considered as a combination of different socio-economic functions in each region (Vreeker, De Groot, & Verhoef, 2004). This concept has been created with the aim of creating spatial and economic synergy of land use to save space by increasing its functional efficiency, while maintaining spatial quality (Rodenburg, Vreeker, & Nijkamp, 2003). This synergy is due to the interaction between activities. Brandt & Vejre (2004) presented three different states of this type of view according to the space-time characteristics of the earth:

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1- Spatial combination of separate land units with different functions;

2- Different functions assigned to the same land unit but at different times;

3- Integrated functions on the same land unit at the same time.

All these three agree on the idea of choosing the "optimal" arrangement and more efficient use of land (Potschin, Klug, & Haines-Young, 2010).

In agriculture and landscape, multifunctional space refers to a space that considers the needs and preferences of owners and users and provides a wide range of useful functions in the dimensions of production, ecology and culture. This concept in the field of landscape, considered

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these 5 roles simultaneously (Brandt et al., 2008, 308; Lovell, 2010, 2503; Otte, Simmering, & Wolters, 2007):

1- Ecological role (as an area for living);

2- Economical role (as an area for production);

3-Socio-cultural role (as an area for recreation and identification);

4- Historical role (as an area for settlement and identity);

5- Aesthetical role (as an area for experience).

Now, if these definitions are combined to achieve a comprehensive definition, a multi-functional urban space is a space that has these two characteristics:

- Having different functions, different actors and different users in different time periods or accepting two or more activities at the same time (accepting more than one function in one activity cycle).

- Including all the plans that a space can accept to achieve economic, social and environmental sustainability.

This type of view has many advantages that can be summarized as in Table 1.

Various examples of such spaces with mentioned features can be identified all over the world. Because citizens in developing countries are more democratic in using urban spaces, they have automatically given more functionality to existing spaces than the function space was initially designed for. In addition, urban managers are more generous in assigning the operation of public spaces to individuals or public and private institutions. In developed

countries, there are more strictures to go beyond the framework for which a space is designed. Although Ziedler (1985) argued that multifunctional design has a history dating back to ancient Greek construction, in the East, space has been used with this definition without being labeled. For example, in the capital of Iran, Tehran, the open space of the University of Tehran is used on Fridays to hold Friday prayers; in the capital of Vietnam, Hanoi, sidewalks have become appropriate fields for badminton; in the French capital, Paris, streets along the Seine River are transformed into urban beaches in the summer, and in many cities and towns around the world, sidewalks are a permanent art exhibition and the parking space of commercial or office complexes is dedicated to holding local markets. To clarify the issue, it can be said that an urban space, in different scales (from a residential complex or an urban block, a neighborhood unit or the whole city) has a defined function which is limited to some hours of the day, days of the month or months of the year. These spaces can be dedicated to other activities in their vacant hours. Private and semi-private spaces can also be dedicated to the public in defined time intervals. Fig. 1 shows this potential in daily, weekly and annual time rhythms. The terraces of cafes and restaurants, which occupy a part of the sidewalk during lunch and dinner, can be an example of a daily rhythm. Local markets are examples of weekly rhythms. For the annual rhythm,

Table 1. The benefits of multifunctional use of urban spaces. Source: Ghafouri & Weber, 2020.

The benefits of sharing use of urban space				
Social Impacts	Environmental Impacts	Economic Impacts		
<ul> <li>-To save travel time and increase effective time for activity</li> <li>-To increase the diversity of activities in an area</li> <li>-To create a vital attractive area that must be re-visited</li> <li>-To improve the citizens' quality of life by offering the possibility for optional and social activities</li> </ul>	-To reduce the material use and pollution caused by new constructions -To reduce urban sprawl and increase density	-To reduce the need for new constructions -To reduce the need for urban travel -To improve the economic performance of the whole space -To save vacant space by intensifying its functionality -To attract a greater number of people at the same time		
		Passage Café-Restaurant Parking Market Blaveround		

DAY ROUND ACTIVITY

WEEK ROUND ACTIVITY

Fig. 1. The potential of multiple use of a certain space in the daily, weekly and annual rhythms. Source: Author.

YEAR ROUND ACTIVITY

Playground Charismas Market Parade, Festival Summer Beach

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summer streets or Christmas markets as examples could be mentioned.

## **Research purpose and hypothesis**

The main goal of this study is to clarify the path of planners and designers towards the concept of multifunctional urban spaces. The hypothesis of this research is based on the fact that despite all the formal differences, there are similar patterns in such spaces that their knowledge can help urban managers and designers to use the existing spaces more efficiently to improve the quality of life of citizens.

## **Research question**

Given what has been said, the question is to what extent does the realization of a multifunctional space depend on physical characteristics? And to what extent it depends on its management and operation.

## Methodology

The research method in this study is based on induction and according to the study of selected samples, their commonalities have been extracted. In fact, although the analysis of case studies has always been one of the tools of designers in approaching the subject of design, in this study, this approach has been adopted in a scientific framework called Case-Based Reasoning.

#### Case-based Reasoning

Today, an integral part of architectural studies and research (in academia and professional projects) is the reference to case studies. Therefore, in all times, referring to previous examples and using previous patterns and experiences is common and reasonable; But how to deduce the learning process, as well as how to apply the patterns in the design (in the form of criteria) has not been clarified, especially in the field of sciences with multiple layers of information and inhomogeneous aspects. Therefore, it seems necessary to emphasize the use of scientific methods used in other domains. Case-Based reasoning was first developed and structured in the field of artificial intelligence and informatics. In a CBR-aided research, it is tried to use common features of studied cases (the lowest layer) to achieve criteria and patterns. This hierarchy is presented in Fig. 2 The aim of the present study is to achieve design criteria and practices. The main idea of CBR is that "similar problems have similar solutions". Therefore, formerly used solutions and models can be used to extract criteria for designing a project in the future.

### • Pattern Language

In his theory entitled Pattern Language, Christopher Alexander proposed the use of earlier patterns in architecture (Alexander, Ishikawa & Silverstein, 1977). Alexander's idea was that when a pattern is repeated, its



Fig. 2. Relation between cases, criteria, patterns and principles in our research. Source: Author based on Alexander, Ishikawa & Silverstein, 1977; Craw, 2017.

multiplicity of use can indicate the pattern's accuracy and general acceptance. Therefore, it can be used as a solution for future problems.

According to Alexander's theory, the outputs of this model can be turned into rules that designers can implement for their future projects. These guidelines offer the designers a framework to adhere to in their design, while maintaining their creativity. Fig. 3 shows how case studies could lead to the extraction of patterns and ultimately design principles.

### Discussion

## Case selection

To evaluate the potential of the multifunctional use of urban space, about 80 samples have been investigated. As the examples including the definition of multifunctionality are very few, some other spaces which have the capacity to become a multifunctional space and some innovative ideas and Pop-ups which might have some lessons to be held were studied as well. The references were searched from summer 2012 to spring 2013. The first case to be obtained using the keyword "multifunctional urban space" was the POPS (Privately-Owned Public Spaces) project in New York, which became the main evaluation criterion in subsequent searches. Then the general keyword "public space" was the basis of the search and it was limited to open urban spaces. Examining each sample provided new keywords for the search, and the CBR method was used to find keywords suitable for searching within the references and finding new cases. In fact, a reciprocal process led to both the selection of samples and the selection of criteria for classification and evaluation of samples, assuring that each urban open space with creative functions and management system includes a representative in the sample list and all important evaluation criteria have been overlooked.

There were two key criteria in selecting a space as an appropriate case study: a space in which the main function changes to a secondary function at certain intervals but

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resumes its main activity again after the completion of the second activity. Or, in addition to the main function, a secondary function is added to the set at certain intervals, but this secondary activity has a certain end time. However, later in the evaluation it was discovered that in some cases it is possible to add a secondary function to the set permanently. Ultimately, half of the cases were spaces that could actually be considered as multifunctional spaces, but the other half were spaces that could be converted to multifunctional spaces or were designed to be multifunctional from the beginning, but could provide significant lessons to extract design patterns for multifunctional spaces<sup>1</sup>. Five of the 80 cases are presented in Fig. 4.

#### • The criteria of analysis

According to Carmona, Heath & Tiesdell (2012), in their book "Public Places-Urban Spaces", there are six different dimensions in urban design: the morphological, perceptual, social, visual, functional and temporal dimensions. Our analysis is based on the physical dimensions rather than perception. To simplify it, a grouping of these areas and classification of them according to their main characteristics were made: space (spatial features), function, and time. Spatial characteristics include morphology (shape and dimensions), characteristics related to actors (owners, managers, employees and users) and project context (a combination of site characteristics



Fig. 4. Top (right to left): POPS project in New York, USA; Badminton courts on Hanoi sidewalks, Vietnam; Pop-up classrooms under the bridges in Eindhoven, Netherlands; Bottom (right to left): Paris beaches in France; Communal gardens in Strasbourg, France. Source: Ghafouri, 2016.

in terms of urban density and socio-cultural characteristics of residents and users). The basis of this classification is shown in Fig. 5. Starting from these six criteria to examine the present case and by applying a reciprocal approach, the search for new cases continued and the CBR method was used to complete the list of criteria so that each new sample would evaluate the whole process from the beginning. The process continued until the criteria were raised to 30 and theoretical saturation was achieved. These 30 criteria were the result of a review of references in the field of urban design and this reciprocal (Carmona et al., 2012; Marcus & Francis, 1997; Kayden, 2000; Carr, Francis, Rivlin & Stone, 1992; Thompson & Travlou, 2007; Francis, 2003; Erell, Pearlmutter & Williamson, 2012; Gehl, 1987, 2010; Ng, 2009). This process is shown in Fig. 6. Table 2 presents the 30 criteria obtained.

#### Studying the cases

As mentioned, there are many examples of such spaces

in the world. Some have been generated without initial planning, but a significant portion of these spaces address legal issues, priority issues and insurance in the phase of decision making. Fig. 7 shows the variety of cases by location and type. Most of the cases are located in developed countries. However, the diversity of these spaces shows that this idea can be used spontaneously or planned in any context and with any social and cultural conditions.The results of the analysis performed on the cases based on the 30 extracted criteria are as follows:

## - User status

According to Fig. 8, although the percentage of utilized space by a specific group of users is remarkable, most of the spaces have been designed for public use.

#### - Type of activity

As mentioned in Fig. 9, most of the spaces which have started as multi-functional space had been designed initially in a multi-purpose way. As a matter of fact, the



Fig. 5. The main concept in classifying the cases. Source: Author.



Fig. 6. Using CBR method to extract the criteria of analysis. Source: Author.

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Identification	Classification	General category	currently multifunctional private to public, semi-public to public, public to public, public to semi-public, public to private, semi-public to private	
			potentially multifunctional mixed-use, pop-up, innovation	
Space	Physic	Morphology and size	line, point (spot) of the surface, point (spot) attached to the surface, small-size area, medium-size area, large-size area, network of spaces, linear small-size area, linear medium-size area, linear large-size area	
	Actors	Type of initial actors	public (state / territorial collectivity), private (individuals, parapublics)	
		Type of secondary actors	public (state / territorial collectivity), private (individuals, parapublics)	
		User status	owner, tenant occupying, specific group, general public (all people)	
	Context	Accessibility	open, connected (attached to another space), closed	
		Location	downtown, suburb, periphery, anywhere	
		Attractiveness (location + activity)	yes (attractive), no (not attractive)	
	ace	Risks (without adding the second function)	no risk, accident-prone, risk of fire, risk of flooding, risk of theft, unsafe, unsecured	
	Characteristics of sp	Change of the legal basis of responsibility of the place	yes, no	
		Protection mode	protected by security, protected by a management system, secure, self-secure	
		Lighting	natural, artificial, combined, no extra light needed (no more than usual)	
		Nature of ground	mineral, synthetic, vegetal, combined, not important	
		Space covering	open, covered, semi-open, combined	
	Method of use	Type of activity	unique, mixed	
		Legal basis for ownership and management	owner user, rental use, free use, illegal occupant, mixed	
		New insurance policy	yes, no	
		Destination of use	change of function, change of function and users, change of users, adding new functions for the same users, adding new users by adding new functions	
		Terms of use	with priority, without priority, not important	
Use		Functions (initial and secondary)	no activity, necessary activities (moving, work, urban infrastructure, etc.), administrative, educational, cultural, leisure (sports, hiking, cycling, coffee shop, etc.), commercial (supermarket, market, retail, etc. ), ecological (green space, water system, ), social (meeting people,)	
		Relationship between function and space	yes (dependent), no (independent)	
	Characteristics of the activity	Nightlife	yes, no	
		Prerequisites	no pre-requisites, furniture, flooring, equipment, shelter, vegetation, lighting, infrastructure	
		Risks	no risk, accidental, risk of fire, risk of flooding, risk of theft, unsafe, unsecured	
		Relationship between activity and climate	yes (dependent), no (independent)	
		Relationship between activity and weather	yes (dependent), no (independent)	
		Temperature	cold, moderate, hot, not important	
		Relationship between activity and sunlight	sunshine needed, shade needed, not important	
	-	Noise pollution	yes (noisy), no (silent)	
Time		Timing	momentary, permanent (daily full-time), daily part-time, nocturne, weekly, monthly, seasonal, annual, occasional, periodic	

Table 2. Synthetically studied cases characteristics (mandatory criteria of analysis). Source: Author.







User status (in brief)



approach of mixed-use to a space incurs the increased function of space potential for maximum use. Even though the number of spaces that have been designed monofunctionally and managed to be allocated to a second function is not ignorable.

## - Legal basis of ownership and management

For the legal fundamentals of space occupation and management, there are several answers: provision of the space as rental or as free possession good, or a way that the owner can personally take the responsibility upon the second function. Sometimes the nongovernmental institutes are involved to help run the place. These possibilities are shown in Fig. 10.

## - New insurance policy

Although it seems that legal restrictions are of great importance in this field, in most cases, as demonstrated in Fig. 11, the legal fundamentals in terms of responsibility and insurance have not been changed. With planning, educating and paying more attention along with determining the priorities, a space can be considered as a multifunctional area. It's important to spend time for introducing this idea to people and encouraging them to look at the space as a "capital" that could be shared, not only between different users, but also between different activities. The notion of "sharing use" is something that might be achieved through informing and education.

## - Destination of use

In studied cases, according to Fig. 12, with addition of new

Type of activities



Fig. 9. Variety of cases according to the type of activity. Source: Author.



Fig. 10. Variety of cases according to the legal basis of ownership and management. Source: Author.



Fig. 11. Variety of cases according to the need for new insurance policy. Source: Author

function, new users have been added to the complex. In fact, the idea of multi-functionality brings the possibility of using spaces by an augmented number of users.

## - Term of use

The priority in using the space should also be elaborated, as shown in Fig. 13. This issue is much more important when there is an interaction between two functions or one of the functions reaches to its peak. In these situations, other functions should be flexible enough to be adapted to the new conditions. In addition, preponderant uses have to be already identified with induced priorities to clarify the necessary requirements and conditions.

#### - Functions

While the process of transforming a mono-functional space to a multi-functional space, in most of the cases in which space has been allocated to necessary activities, the number of users augmented (as mentioned in Fig. 14). These spaces have been transformed into spaces for recreational, social and cultural activities. The augmentation of these activities in urban public spaces caused the promotion of space quality and citizen's life quality as well.

#### - Timing

According to Fig. 15, the diversity between studied cases regarding their rhythm and time indicates that the space can be used as multifunctional for a period of time from few minutes to several months. Choosing appropriate activity is related to its rhythm and vacant hours of the space.

#### - Relationship between functional operation and space

As demonstrated in Fig. 16, a meaningful relationship between functional operation and space has not been observed. In other words, although the functionality of space depends on its form, functional optimization (increasing functional density) could be done for various spaces despite their physical form.

### - Nightlife

In most of the cases (as presented in Fig. 17), it has been tried to use the maximal capability of space during the night. In fact, space not only changes daily life of citizens, but also enriches nightlife. Here, a relationship between multifunctional with a 24-hour spaces could be observed.



Fig. 12. Variety of cases according to their destination of use. Source: Author.







Fig. 14. Variety of cases according to their functions. Source: Author







Fig. 16. Variety of cases according to the relationship between functional operation and space. Source: Author.

In fact, a 24-hour space could be the promoted and completed form of a multi-functional space.

## - Prerequisites

Usually, as illustrated in Fig. 18, in adding new functions to a space, there exist prerequisites such as furniture and equipment. In most of the cases, prerequisites such as equipment, flooring, lighting and infrastructure should be taken into account. Depending on the function, these prerequisites could be different. The best and efficient method is putting those spaces on priority that are in a less need to equipment and new infrastructure.

#### - Risks of activity

Adding a new function to space augments the possibility of risk and danger in the space according to Fig. 19. Recognizing these dangers and predicting demarches for preventing the risks is an important factor in viability of space in a long period. In some cases, spaces which their function has been augmented to be used by a great number of users, due to lack of risk management, have encountered problems and had to cease their second activity.

#### - Relationship between activity and climate

A remarkable and meaningful relationship does not exist between the capability of transforming a space to a multifunctional space and the climate which the space belongs to. As mentioned in Fig. 20, this concept could be applied anywhere in the world.

## - Relationship between activity and weather

Since in our studies, open spaces have been examined, it is normal to have a meaningful relationship between activity and weather condition as elaborated in Fig. 21. Of course, considering environmental conditions is an important point while designing the primary function.

## - Temperature

According to Fig. 22, a notable relationship between defined activity and temperature of space could not be observed. In fact, in most of the cases, selected additional functions do not need specific temperature and could occur in normal conditions.

## - Relationship between activity and sunlight

A notable relationship between defined activity and



Fig. 17. Variety of cases according to the nightlife. Source: Author.



Fig. 18. Variety of cases according to the prerequisites. Source: Author.



Fig. 19. Variety of cases according to the risks of activity. Source: Author.



Fig. 20. Variety of cases according to the relationship between activity and climate. Source: Author.



Fig. 22. Variety of cases according to the tempreture. Source: Author.

sunlight could be observed (presented in Fig. 23). In cases of secondary function, there is a need which has been predicted for shade, parasols or coverage for protecting users from sunlight.

#### - Noise pollution

The augmentation of new users leads to the augmentation of noise pollution. Although in studied cases, as illustrated in Fig. 24, designers have tried to control the increased noise pollution.

#### - Morphology

From the morphological point of view, a notable variety in form and size could be observed (shown in Fig. 25). Each space, based on its capabilities, presents different potentials for new users. Creativity of planners, in searching for new facilities in a new space, has led to different and varied incomes, all successful in their own context.

#### - Accessibility

According to Fig. 26, he chosen spaces are the directly accessible spaces. In other words, direct access to most of them is possible. Nevertheless, the frequency of spaces that are controlled by an entrance gate or access to them is possible through another space, is remarkable, the direct access provides a greater potential for making a multifunctional space.

## - Location

Most of these spaces, from the location point of view, have not been restricted to a specific zone (shown in Fig. 27).

### - Attractiveness (location + activity)

Usually, those spaces have been chosen for a secondary

Relationship between activity and weather



Fig. 21. Variety of cases according to the relationship between activity and weather. Source: Author.





Noise pollution

Fig. 24. Variety of cases according to the noise pollution. Source: Author.

No

61%



Fig. 25. Variety of cases according to the morphology. Source: Author.



Fig. 26. Variety of cases according to the accessibility. Source: Author.

function that, initially, had peculiar attractiveness (e.g. location) for public. This potential (connecting to attractive points) has increased the percentage of success as a multi-functional space, as presented in Fig. 28.

#### - Risks (without adding the second function)

The chosen spaces for having a secondary or added function, from location and proximity point of view, were low-risk spaces (illustrated in Fig. 29). In fact, those spaces whose security was provided whether by physical barriers or manpower had been chosen.

#### - Change in the legal basis of responsibility of the place

As mentioned in Fig. 30, the frequency of change in the responsibility of the space with deficiency of change in responsibility is relatively equal. This illustrates that change in responsibility or deficiency of change could be examined from a different point of view and also be presented by different solutions. Each city and zone, depending on its culture and laws, has peculiar conditions that could be different from the adjacent zone or city.

#### - Protection mode

In most cases, according to Fig. 31, prerequisites for providing security of people and space equipment have been predicted. In a remarkable part of studied cases, users are in charge of protecting the equipments, their belongings and themeselves. - Lighting

Since, the main purpose of increasing the functional hours of a space is having more efficiency and extended working hours, in most cases there is a need for preparation of extra lighting (as presented in Fig. 32).

The relationship between a multifunctional space and a 24hour space could be observed here. In fact, a 24-hour space is an upgraded and optimized form of a multifunctional space - as defined before.

### - Nature of ground

According to Fig. 33, the variety of studied spaces, from grounding point of view, illustrates that creation of multifunctional spaces in natural and artificial environments is possible.

#### - Space covering

The examined spaces were mostly open spaces. These spaces, normally, in their secondary function remained opened







Attractiveness

Fig. 28. Variety of cases according to the attractiveness (location + activity). Source: Author



Fig. 29. Variety of cases according to the risks (without adding the second function). Source: Author.

# Change in the legal basis of responsibility of the place



Fig. 30. Variety of cases according to the change in the legal basis of responsibility of the place. Source: Author.









Fig. 32. Variety of cases according to the lighting. Source: Author.



Fig. 33. Variety of cases according to the nature of ground. Source: Author.



Fig. 34. Variety of cases according to the space covering. Source: Author

and the need for preparing a cover or parasol has not been observed (as shown in Fig. 34).

## Conclusion

Examination of the mentioned 80 cases based on the obtained criteria and their classification led to 12 patterns. The repetition of each pattern (frequency) is variable. If the frequency of each pattern could be considered as equal to its feasibility (possibility to be repeated), the amount of designer's attention to each pattern could be extracted in a quantitative form. Fig. 35 illustrates the frequency (percentage of repetition) of each pattern in all the eighty examined cases. The similar patterns in the left chart are grouped in the right one to achieve a more coherent result.

There are eight conceptual patterns extracted from analyzing the cases. These patterns could help the architects and urban designers find their concept as the starting point of their concepts as the starting point of the design process. These patterns include:

-**Participation:** bringing all the actors and future users into the step of decision making, trusting and giving them the sense that the space belongs to them, educating those concepts related to citizenship and urban life, changing the meaning of public space in citizens' minds, from no one's belonging to everyone's shared capital; increasing the scene of belonging to spaces with interfering them in planning, changing, and managing the space;

-Production, education and sport: using the space for

producing agriculture products, educational or sportive activities; e.g. the secondary function of space would not be restricted to more recreational activities;

-Mixed-use master planning with a Network of activities: having a multi-purpose approach to the design, considering space not only as an island but as a part of net activity that can be efficient in changing the life of its zone or neighborhood;

-Using lost, dead or forgotten spaces: using dead and forgotten spaces like rooftops and undergrounds (vertical city) and also vacant lands that, in addition to an efficient use of existing spaces, to help solve social problems and provide security;

-Innovation and playability: using forms, combination and functions that are attractive for kids -or in a creative way leads to their involvement with the environment, applying innovative solutions that are new for citizens or having a different approach toward the question;

-Lighting: planning for an active night life, expanding working hours of a space along modern lifestyle which leads to overriding of nightlife and thereupon, lighting for providing security and aesthetical purposes;

-Using art: involving art in everyday life as media and as aesthetical elements;

-Transformable surfaces and portable urban furniture: providing the possibility of personalizing the space based on users' needs by portable furniture, adding specific characters to the space or using space in peculiar occasions by designing transformable surfaces. These eight patterns are shown in Fig. 36. The idea of multifunctional space design can be introduced from the beginning, in the process of architectural and urban design, by creating a comprehensive master plan based on multipurpose areas and shared use of space. This approach may lead to the creation of a network of activities. By reviving roofs, basements and vacant spaces besides designing flexible, removable furniture that can be adapted to new conditions or activities, the way is paved for people to use their creativity in the use of space. Considering sustainable design issues takes this kind of view to another horizon: increasing density while maintaining citizens' quality of life and being ready for future changes. But in the end, it should be noted that "shared use" is a culture. It takes time to introduce this idea to people and to encourage them to use space as an asset that can be shared, not just between different users but between different activities. The culture of "shared use" of resources, capital and facilities is something that can only be created through information and education over time.



Fig. 35: The frequency (percentage of repetition) of each pattern in all cases. Source: Author.



Fig. 36: Eight conceptual patterns extracted from analyzing the cases. Source: Author.

# Endnote

\*This paper is extracted from Doctoral dissertation of "Atieh Ghafouri" entitled "Sustainable Urban Form; Multifunctionality and adaptation" conducted by Dr. Christiane Weber, in 29 June 2016, University of Strasbourg, France.

1.Internet resources were:

sciencedirect.com, www.pps.org, www.publicspace.org, www.asla.org, www.dezeen.com, www.arcdaily.com, www. worldlandscapearchitect.com, etc.

Keys used directly in search engines were:

multifunctional space, multifunctional urban/public space, multi-

purpose urban/public space, multi-use urban/public space, mixeduse urban/public space, multiple usage of urban/public space, transformable space, innovative urban/public space, adaptable urban/public space, shared use of urban/public space, diversity in urban/public space, mixed-use urban development, mutual activities in urban/public space, collective achievement across time and space, space-time in urban/public space, cooperative use of urban/public space, temporary public space, temporary city, combining functions, functions synchronization in urban space, etc.

# **Reference list** \_

• Alexander, C., Ishikawa, S. & Silverstein, M. (1977). *A pattern language: Towns, buildings, construction*. New York: Oxford University Press.

• Brandt, J. & Vejre, H. (2004). *Multifunctional landscapes - Motives, concepts and perspectives, Multifunctional landscapes - Theoty, values and history.* London: WitPress.

• Carmona, M., Heath, T., Oc, T. & Tiesdell, S. (2012). *Public places - Urban spaces: The dimensions of urban design.* Burlington: Architectural Press.

• Carr, S., Francis, M., Rivlin, L. G. & Stone, A. M. (1992). *Public space.* Cambridge: Cambridge University Press.

• Craw, S. (2017). Case-based reasoning. In C. Sammut, G. I. Webb (Eds.), *Encyclopedia of Machine Learning and Data Mining*. Boston: Springer.

• Erell, E., Pearlmutter, D. & Williamson, T. (2012). *Urban microclimate: Designing the spaces between buildings*. London: Earthscan.

• Francis, M. (2003). *Urban open space: Designing for user needs.* Washington, D.C.: Island Press: Landscape Architecture Foundation.

• Gehl, J. (1987). *Life between buildings: Using public space*. Washington: Island Press.

• Gehl, J. (2010). *Cities for people*. Washington: Island Press.

• Ghafouri, A. (2016). Sustainable urban form; multifunctionality and

adaption: Redefining urban spaces as multifunchtional shared areas. Unpublished doctoral thesis, University of Strasbourg, Strasbourg, France.

• Ghafouri, A. & Weber, C. (2020). Multifunctional urban spaces: A solution to increase the quality of urban life in dense cities. *MANZAR*, 12(51), 36-47.

• Kayden, J. S. (2000). Privately owned public space: The New York City

experience. New York: John Wiley.

• Lovell, S. T. (2010). Multifunctional urban agriculture for sustainable land use planning in the United States. *Sustainability*, 2(8), 2499-2522.

• Marcus, C. C. & Francis, C. (1997). *People places: Design guidlines for urban open space.* New York: John Wiley & Sons.

• Ng, E. (2009). *Designing high-density cities for social and environmental sustainability*. London: Earthscan LLC.

• Otte, A., Simmering, D. & Wolters, V. (2007). Biodiversity at the landscape level: recent concepts and perspectives for multifunctional land use. *Landscape Ecology*, 22(5), 639-642.

• Pérez-Soba, M., Petit, S., Jones, L., Bertrand, N., Briquel, V., Omodei-Zorini, L. ... de Groot, R. (2008). Land use functions – A multifunctionality approach. In K. Helming, M. Pérez-Soba & P. abbush (Eds.), *Sustainability impact assessment of land use changes*. Berlin: Springer Berlin Heidelberg.

• Potschin, M. B., Klug, H. & Haines-Young, R. H. (2010). From vision to action: Framing the leitbild concept in the context of Landscape Planning. *Futures*, 42(7), 565-667.

• Rodenburg, C. A., Vreeker, R. & Nijkamp, P. (2003). Multifunctional land use: An economic perspective. In C. A. Rodenburg, R. Vreeker & P. Nijkamp (Eds.), *The economics of multifunctional land use: Experiences and policy lessons.* Maastricht: Shaker Publishing.

• Thompson, C. W. & Travlou, P. (2007). *Open space: People space.* London: Taylor & Francis.

• Vreeker, R., de Groot, H. L. F. & Verhoef, E. T. (2004). Urban multifunctional land use: Theoretical and empirical insights on economies of scale, scope and diversity. *Built Environment*, 30(4), 289–307.

• Zeidler, E. H. (1985). *Multi-use architecture in the urban context*. New York: Van Nostrand Reinhold.

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