

The Extent to Which Social Factors Affect Urban Functional Mutations and Transformations

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Abstract—Contemporary metropolitan areas and large cities are dynamic, rapidly growing and continuously changing. Thus, urban transformations and mutations are not a new phenomenon, but rather a continuous process. Basic factors of urban transformation are related to development of technologies, globalisation, lifestyle, etc., which in combination with local factors have generated an extremely great variety of urban development conditions. This article discusses the main urbanisation processes in Lithuania during last 50-year period and social factors affecting urban functional mutations.

Keywords—Dispersion, functional mutations, urbanisation, urban mutations, social factors.

I. INTRODUCTION

INFLUENCED by the current globalisation, large cities are continuously changing, engaging mutations of urban functional structures. Scientific literature names the process of function transformation as the function mutation and analyses mutations only in the large city context and scale. However, it is much broader phenomenon covering social, economic, cultural, and other aspects. It changes not only the physical but also urban functional structure. The urban mutations in scientific literature are analysed only in the metropolitan context.

In Lithuania, over the 1960–2009 period, negative consequences of different planning systems have formed, i.e. urban function mutations [1], urban blight and planned transformation of urban structures (forced mutations). The soviet planning system, in which urban planning was determined, was a “generator” of self-contained spontaneous processes. After the independence of Lithuanian residential construction changed, privatisation, land and real estate return processes began. Market conditions and rising land prices in Lithuania has changed the urban development relocating residents and functions of the central parts of cities.

Mutations are not a new phenomenon, but this area still lacks deeper scientific research on functional mutations. It would be incorrect to state that function mutations are a positive or negative phenomenon, as it is a controversial process. Mutations emerge from a faulty, chaotic residential and industrial areas layout, land use, unmanageable urban growth, and variety of factors. Initiated or indirectly instigated mutations are the principle of finished product applied to planning and development implementation stages. These

mentioned problem areas determined urban functions change and dynamics.

Urban functions are a very flexible part of urban structure, sensitive and allowing for a deeper insight to urban structure problems and factors influencing them. Based on the statements by [2], a city, its urban structure and significance depend on its size and sphere of influence. Therefore, a city development level and size is directly proportional to the urban function mutations, their dynamics and amount.

Numerous world cities down-towns no longer have any unanimous structure due to the factors that determine the development of cities. It is quite usual transformation and diversity of functions determined by the aforementioned factors, as well as the demand formed by the market. Any classification into functional zones of the down-town area is impossible due to the location of functions in space. While exploring historical and contemporary functions of a classic city, the problem of their complexity and multi-functionality is faced [3]. All this makes classification of functions according to activities more difficult. In the city development process, the market economy changes regarding political orders. Then new types of functions appear, and the old ones change, undergo transformation and mutate. New digital technologies gradually cause certain threat to the urban structure model. Besides, spreading multimedia products have shown a social interaction between new forms also transforming the ways of how the city space and function are used by people, communities.

II. GENERAL FACTORS CONDITIONING FUNCTION MUTATIONS

According to [4] the transformation and mutations of urban functions are induced by: urban planning, political decisions, market and economic conditions, social factors, etc. The discussed factors condition transformation and distribution of functions in cities. They cannot be distinguished as separate, since interrelation between these factors and urban functional structure is continuous and close.

The research and factors conditioning function mutations confirm that manual work is not needed as physical distances and time barriers disappear and social habits and community relation are in the process of a new urban model formation.

The expansion (urban sprawl) has become a mass phenomenon when certain preconditions appeared – i.e. mass auto mobilisation and financial opportunities to acquire new housing. Considering the examples in economically developed and financially stable countries, it was established that the processes of population migration and urban expansion could be controlled with the help of urban planning, where time was

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regulated in the planning. Thus, functional and physical urban transformations and mutations can be controlled, tamed and framed. All self-contained or forced planning processes going on in cities or factors preconditioning such processes have certain economic, social, physical, etc. outcome.

Under conditions of the early 20th century trade, transport, communication, finance, and management [5] made up a group of classifications business areas, which used to distinguish central parts of cities and metropolises.

The Athens Charter of 1933, which emphasizes functional urban zones (the main zones – residential, industrial and recreational that make up one structure), gained a more radical functional character in the light of post war conditions. The city was no longer acknowledged as a tree or a live organism [6]. Static buildings – mega structures have become a dominant element of the city. The city becomes similar to a machine, where almost all its functions and services become automated. Abstractedness, transformation of forms, simplicity, minimalism, and technical character become new values [7].

The conducted urban functional mutations and transformations research took Vilnius city classical urban development stage as an example for the subject of the research [3], which is the best example of historic and dynamic urban development. The historically formed street network, diversity of functions and population density and slightly changed physical urban structure enable to establish and identify the moments of functional transformations, advance, and mutations.

According to the conducted empirical research [3] and academic literature studies we can state that the transformation of urban functions and mutations are initiated by different individual factors such as urban planning, political decisions, market and economic conditions, social factors, lifestyle, development density of the urban territory, the income level of population and short functional relations of physical structure [4]. However, making a review of specific factors they should be grouped according to their general features (Fig. 1).

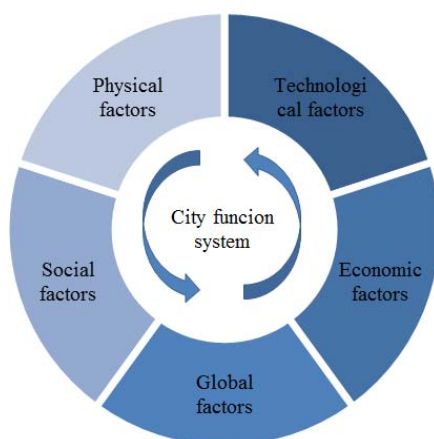


Fig. 1 Factors of urban function system

As functions of the central part of the city and lifestyle of people change, so does the function as a component. In the opinion of most scholars [8] the downtown becomes the Skansen to tourists and a residence for wealthy people. M. McLuhan [9] said that cities as such don't exist anymore; they are just "cultural ghosts for tourists". A city that was perceived by prominent theoreticians of urban planning such as L. Mumford, C. Alexander and J. Jacob cannot function as before and make up a harmonious and unanimous unit [10].

The world globalisation has become a very popular word in nowadays academic literature. Its concept is widely prevalent; it explains the awareness of globalisation and belief that the world becomes smaller. Developed technologies not just among cities, but also among different regions, countries and continents enable people to travel without any restrictions. Thus, central parts of cities have become more focused on tourists. The problems of urban tourism have been analysed in academic literature of most countries and several major problematic areas have been identified and described as follows:

- 1) a city becomes more tourist-like;
- 2) a city becomes flat;
- 3) a city becomes modified;
- 4) cultural urban homogenisation is in progress;
- 5) city centres are too much "rehabilitated" and have become a commonplace.

Globalised cities, capitals, people and metropolises converge due to tourist visits, similar urban development, changes in culture and business. Urban identity, abundance of exclusive functions or municipality strategy with regard to the city fails to maintain this exceptional nature among different cities [11].

Dispersion of new digital computerised technologies via various fields of activities has also a strong influence on human behaviour and the "usage patterns" of the city. This new phenomenon "virtualises" functions in the current territory and gradually reduces functional expenses of the city by defining new processes of distribution of functional loads. Besides most old territories are being reconstructed and old industrial buildings transformed into attractive expensive apartments. Art galleries, cultural and expo centres retreat due to art and culture transformations as a result of development of electronic networks and digital functions.

III. SOCIAL FACTORS

One of the first changes in the social stage has been determined by the industrial revolution. It has significantly changed not only the world but also social and economic life of people, lifestyle and attitude towards things [12]. Spatial and social urban segregation is not a new phenomenon. Spatial "splitting" by social features in urban agglomerations has become more pronounced over a quarter of the century and this phenomenon has become more vivid as a result of disintegration of urban functions and expansion of the city to periphery [4]. Increase or drop of real estate prices add to even bigger social splitting and exclusion that is the outcome of economic factors [13]. As a result of increase in real estate and

land prices, closed communities form, which join representatives of certain income and certain social class. These communities are often referred to as gated communities in foreign literature.

The risk of social segregation has also increased by abandoned and unattractive residential territories, which have been vacated by wealthy inhabitants [14]. However, in different countries prestigious residential areas, sometimes called harmonious areas - islands [4] are socially integrated into territories of lower social class during implementation of particular planning strategy. Social diversity of residents helps to develop a safe and attractive environment that is supplemented with good service infrastructure. In absence of such diversity, cities undergo social segregation and residential areas simply develop into closed communities, particular poles, called ghettos and this is the greatest risk that cities face [12].

In the course of social processes of urban globalisation, people go over the stage of economic development and follow cultural development. Then they are more focused not on social welfare but on spiritual values and cultural and art trends. Then we face a paradox: in the process of globalization everything converges: lifestyle, habits, everything becomes available and when people realize this, they start to seek exclusiveness and unique character in art, fashion and culture.

Changes in economy and digital technologies have also encouraged significant changes in relations between women, men and children [15]. The structure of urban population changes; the wave of youngest population purposefully follows development of new residential areas, thus the structure of population changes continually. The process of demographic structure of population and the process of territory rearrangement has been initiated by a concentrated and flexible construction of residential areas and giving a flat according to the list that was prevailing during soviet period [4].

A different composition of the family, changes in population and labour affected the concept of a family and size of the family. Composition of the family has reduced to two members from five in the 19th century [12]. Such a phenomenon can be explained for several reasons – a longer life expectancy, later family life, less children in the family, bigger number of divorces and single fathers and mothers and women's economic independence.

In a contemporary life of uncontrolled and unmanaged transformations people tend to group according to categories of identity [12] – on the basis of religion, ethnicity, territory or nationality. Communities of a new type form not just according to the abovementioned categories of identity but also according to the environment of advanced technology users when digital environment that has replaced the old urban environment mobilizes people on the basis of general values and interests in virtual environment. Prevalence of social environment is related to metropolisation, which promotes the processes of per-urban dispersion of population and special and social exclusion. The results of the surveys conducted by scholars have revealed that the more time people spend

browsing the Internet, the less time they spend with their family. Thus, their circle of social contacts narrows, the feeling of depression and loneliness becomes deeper. People, fearing and not used to expressing themselves in public, use virtual environment for that, the user of which is not asked to identify him/her. In such social networks and environment people usually group according to the groups of culture, religion, interest, education and identity. Identity of such communities can be strengthened by way of various public events, external ways of expression – this secure socialization of individual players on network. Nonetheless, these means can also have adverse effect. They can form passive and self-confident communities where communication and relations are not focused on productive innovative activities.

IV. FUNCTIONAL TRANSFORMATIONS IN THE SAMPLE OF VILNIUS CITY

The Athens Charter of 1933 announces the beginning of a functional city in Europe. A city starts to be divided into functional urban areas and the mixed function is intended to be focused in the city centres. A chaotic development of a city in Lithuania is controlled with the help of a general plan. In the periods of urban development, we can single out three main development stages that have encouraged development of functional mutations and their rise, such as: industrial revolution, urbanization and the stage of new digital technologies.

Mutations as the research subject of empiric urban function transformations have been established by complex factors such as: urban planning, economic conditions, social factors (lifestyle, density of the urban territory and the income level) and short relations of physical structure. However, they complicate a classification of urban functions. The functions in question can be structured by classifying them according to the line of activities (industry and recreation) and grouped according to features (durability and flexibility). Structuration of functions can be related to multiplicity of functions and possibilities for mutations; however function dependency on the scale, location and variation should also be taken into consideration.

During the research dominating functions such as *residential, trade, catering, utility services and government offices* have been singled out in the studied streets. However the dominating areas of functions and their number have changed significantly during the chosen period of the research. Dynamics and transformation of dominating functions in the period in question revealed the character of a changing city, which has transformed from the previous residential territory to the shopping avenues – the Skansen for tourists.

Social segregation, splitting and exclusion caused as a result of economic factors and the price of real estate in the central area of the city have also been observed, which increases disintegration of urban functions and urban expansion to the periphery.

The research has covered the area of Pilies St., Didžioji St. and Ausros Vartu St. that stand out for the dominating residential, trade and catering functions. The functions in

question are vulnerable to change-triggering factors; however the reaction time of functions is different. Time of reaction for residential functions unlike trade and catering functions are slower. During the research the decrease of residential function, splitting and growing smaller has been identified in the light of growing economic development and real estate prices. As a result, the dropping number of population determines disappearance of utility services and other correlating functions and their advance to the periphery.

Making research of the abovementioned zones of city streets different factors have been studied that affect groups of different functions. Domination of functions in street zones is distributed by periods in view of inter-functions during different periods. Therefore diversity of functions in central part and downtown of the city and the already formed social and demographic structure of population that is affected by other factors, transform the city core. Development and transformations of urban functions in the last two decades has not been controlled; processes have been occurring by themselves (mutations). The current situation and tendencies of the evolution of functions fail to correspond to the "healthy" urban centre and balanced development methods.

Social, economic, cultural, technological, and other factors that affect dynamics of urban functions and dispersion of mutations affecting a contemporary city cannot be singled out as separate. In central parts of cities and historic places priority is given to pedestrian traffic, however after the public transport flow was reduced, the number of cars increased, which increases spread of functions and decentralises them. Thus the newly established shopping centres overtake historic cores of cities and take over their functions. Thus, there is a risk that historic centres may disappear. Purposeful and measured application of correlated functions in the historic parts of the city would become as sources of attraction that would bring back people to historic centres.

Dwellings located in the central part more and more often become a second dwelling to people. In most European cities this happened when young people moved retired parents to the dwelling located in the suburbs. However, dwellings located in the centre are left for good access to services and financial investment.

Development of contemporary cities affected by market economy is inherent to social factors, globalization, new technologies, and various other factors. Direct vertical and horizontal interaction of the abovementioned factors over time change physical and functional surroundings of the historic centres and structure. Physical structures are preserved in historical centres; however, no attention is drawn to preservation of their functional structure. Thus, not just the price of land in historical centres but also functional balance should be controlled by making a proper proportion between population and functions and maintaining the balance between economic and social development of the city.

Growing city centres being affected by dynamic processes are inexorably developing in all dimensions – out, in and up. Mutations taking place in the city affect not just time and space, but also urban functions when older functions are

replaced with the new - more popular and flexible. Such fast mutations of urban functions can be explained with a newly formed digital layer in the urban system. However conveniences offered by new digital systems rapidly reduce physical mobility of population and digital mobility becomes active and hardly measured. In the process of improving vehicles and communications individual environment of people and travel time also change, which can hardly be measured. Thus, we can make a definite statement that city boundaries melt in space and time. In order cities were lively, in the opinion of R. Rogers [12], buildings and spaces in cities have to be planned so they could be easily accessed, trade was carried out in cities and people could contact and innovations were promoted. Cities should be verified and constantly rearranged so they could meet the rising new needs. Only well verified and implemented projects add to good functioning of a dense urban structure by consolidating conflicting tendencies of the city life.

Development rate of globalisation and technologies remove all barriers for the global migration of population, lead minor special functions towards disappearance and average and big scale functions mutate to complex and digital ones. Therefore new urban structures with residential models typical to them form. Functional quality of the living environment depends on existence of social services, accessibility, and their diversity. According to [4] a formal logic of planning says that indicators of functional quality should be maximum and their theoretical dispersion – smooth.

Decreasing number of inhabitants in the city centre and downtown and formation of a specific social and demographic structure of population alongside other factors may cause a risk of crisis to the central core.

V. FACTORS DETERMINING MUTATIONS OF THE CONTEMPORARY CITY

R. A. Boschma and J. G. Lombooy [16] stated about formation of a learning city can be applied by summarising factors affecting a contemporary city. They said that the main factors for formation of a contemporary city are smoothly operating communications and constant processes of transformations. Since urban culture is the basis for continuous functional and physical transformations it mostly refers to intangible and historical factors such as historical political systems, publicly recognised standards, technological advances, infrastructure and cultural development, etc.

Factors discussed in the article, affecting functional transformations and dispersion in cities cannot be distinguished as individual, since the link between factors and functional structure of the city is uninterrupted and closed (Fig. 2). Therefore, in nowadays society intellectual work does not require footwork. Physical distances and time barriers disappear. With reference to the results of the research conducted for the urban function transformations [3] we can make a direct statement that new social habits and community relations are forming. Telecommunication systems enable combining functional systems of the city (workplaces,

transport system and residential territory) and create a new model of an urban (digital technologies) city.

All above-mentioned factors that initiate mutations are met both in Lithuania and in the biggest cities around the world. They do not highlight the character and individuality of the city but lead to disappearance. Globalisation and the development speed of information technologies remove most barriers, activate global migration and emigration and ignite cultural assimilation and convergence [17].

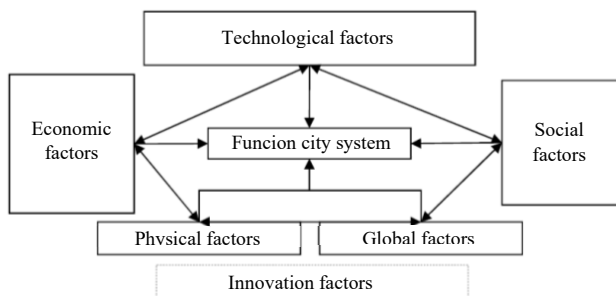


Fig. 2 Faction factors model

Functional system of the city consists of urban functions, communications and relation to communications. A physical system of the city consists of buildings, streets and squares, inside of which functions and communications operate. The old physical functions (energy, telecommunications and etc.) are replaced with the new ones – stream. According to R. Papa [18] a physical urban system and its prospects are defined in the concept of city dimensions, because these are the images which each of us have and understand. These are images arising out of complex relations between physical and functional structure of people (population of the city).

VI. FUNCTIONAL DISSEMINATION OF FUNCTIONAL MUTATIONS AND FORMATION MODELS

Contemporary cities of the world face a problem when they become less significant and can be described according to their two features – a global or local city. On the other hand, similar lifestyle, cultural homogenises and globalisation made capitals around the world similar according to tourist flows, organisation of hotels, location of shopping centres and mega events (Olympic Games). These factors and phenomena explain the processes taking place in cities around the world simultaneously. Another relevant problem of the city is revitalization when reconstruction and projects for the rescue of monuments of historic heritage and city centres are prepared. Having implemented the program for arrangement of urban centres and new functions they become common and tourist flows and functions (centres of attraction) displace people from city centres. D. Bardauskiene [19] states that cities become empty as a result of less population, since they cannot settle down because of market prices of the dwelling. Besides, downtown buildings need a particular care; however, their owners very often cannot afford themselves to do that. Both reconstruction projects and tourism increase real estate

inflation and alongside gentrification correct the trade sector, too. In such a small and compact city as Vilnius, this does not seem to be a big problem. The city centre can be easily accessed by people from suburbs, too. There are enough cafes, clubs not just for tourists but also for Vilnius inhabitants. Government of other countries' cities (e.g. London) had to buy out abandoned downtown buildings and rearrange them and later it started the policy of affordable housing.

When cities and suburbs develop not just shopping centres but also hotels are being built in suburbs, territories close to densely populated territories and shopping centres, where leisure functions are arranged closely by creating centres of attraction because of cheaper land prices.

TABLE I
CHANGE OF POPULATION IN 1980-2010 (VILNIUS CITY MUNICIPALITY MASTERPLAN 2015, SUPPLEMENTED BY THE AUTHOR) (THOUSANDS OF INHABITANTS)

District	1980	1995	2004	2010
<i>New centre</i>	9	8,7	7,49	4,5
<i>City centre</i>	9,8	9,1	7,16	6,5
<i>Old town</i>	28	22,8	19,57	20

In the process of world globalisation, urban functions of narrow profile are doomed to extinction and functions of average and big scale mutate to complex and composite functions by eliminating the above-mentioned ones.

Nowadays, development methods and tendencies of residential territories are radically changing. Territories are planned as closed villages where secluded communities that have no strong relations with the neighbours live. These new residential territories often have no clearly defined or marked territorial boundaries, because in densely populated cities or countries boundaries of different territories are hardly defined. The only feature, typical to all cities, is that density of functions and concentration in the centre of the city is much bigger and it decreases proportionally going to suburbs towards settlements of small closed communities. These tendencies make us think that such houses or residential territories separate from social environment and live in a new isolated environment that is based on new technologies that do not require urban infrastructure.

Houses are equipped with all required facilities of information, knowledge and technologies, etc. According to [15] such houses, even if they are separated from the residential territories and cities, can become an isolated and inhospitable place. The size of such isolated separate locations where people live and work depends on transport and the development level of new technologies. However now we cannot compare these parameters, since a trip by bike, car, fast train, plane and new telecommunications are very different and immeasurable values. Thus, we can say that boundaries of a contemporary city melt in time and space because of parameters, the range of which cannot be measured neither by time, kilometres nor other measurement methods.

VII. FUNCTIONAL TRANSFORMATIONS PHYSICAL, SOCIAL AND ECONOMIC OUTCOME OF FUNCTIONAL MUTATIONS FOR STABILITY OF HISTORIC ENVIRONMENT

Reasons for urban territorial expansion are multiple. Usually this is the outcome of lifestyle and living conditions (environment and type of dwelling) based on the principle of free choice contrast. Expansion has become a mass phenomenon with the rise of background such as expansive auto-motorization and financial possibilities for buying a new dwelling. People from villages and districts move to cities and distribution in economic activity areas changes too. Less

people are employed in agriculture and more in financial sector. However, a significant rise in employment is observed in such areas as industry, constructions and science. In view of examples of economically developed and financially stable countries, the migration of population and urban expansion processes are managed with the help of urban planning when time is controlled and fixed how much time is given and can be given for realisation of different processes, detailed and thorough calculations are made to what extent the city can expand. Thus functional and physical urban transformations and mutations are controlled, managed and forced into mould.

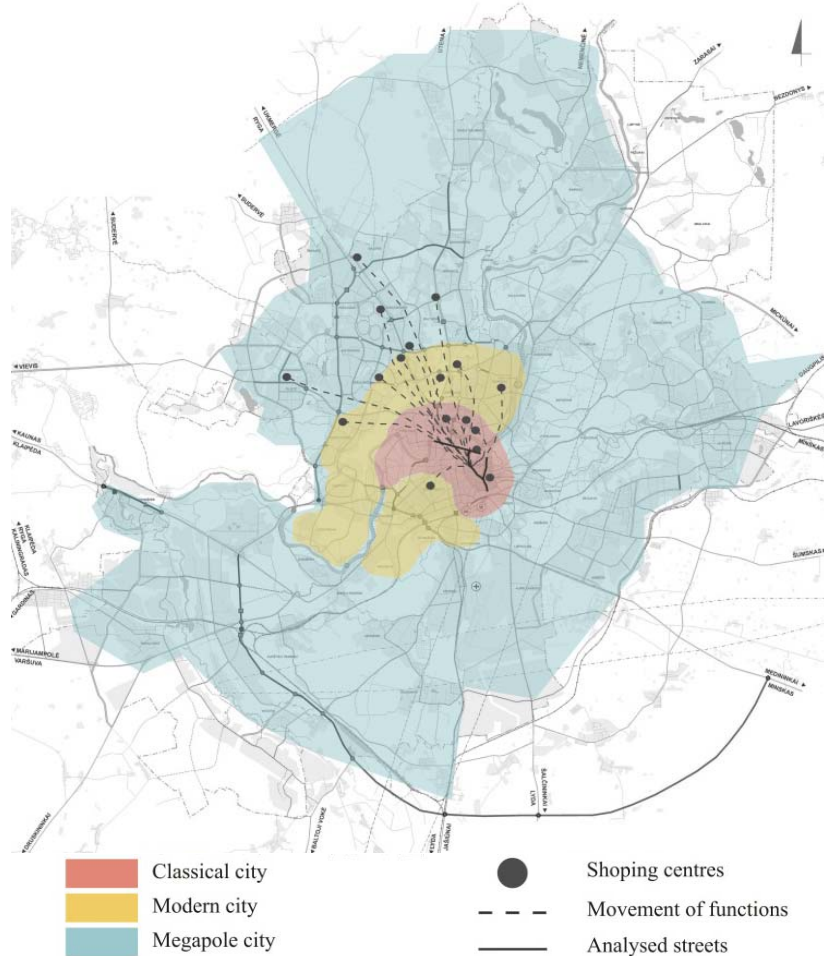


Fig. 3 Location of functions in the urban development periods

A. Outcomes of Social Factors

Social factors are inseparable from economic factors. In most cases the outcomes caused by economic factors reflect as social outcomes. One of the most marked outcomes of economic factors is social segregation. Although goals and ways vary, social outcomes are related. This process is the consequence of economic factors; the increased or dropped prices of real estate caused by it encourage radial migration of population. "Splitting" and social exclusion samples of this phenomenon are reflected in residential areas and central part

of the city. Socially vulnerable groups of population are pushed away from the central parts of the city because of high rent and real estate prices and low number of social housings.

Low income and socially vulnerable groups are resettled or moved to the periphery or densely populated neighbouring urban territories promote the phenomena of social-spatial misbalance in all city. In foreign practice, social diversity of population is encouraged by way of planning and regulations, creating "healthy" and proportional diversity of population.

This type of social diversity of population helps to create a safe and attractive living environment.

In social terms, globalisation is a process that is continuation of modernization process that includes society, nations, ethnic groups and countries despite of their geopolitical situation [8]. Globalisation is not just a modernisation process; it is the process that assimilates technologies, culture, economy and education, etc. Outcomes of this phenomenon are double: positive and negative. The positive ones are technological dispersion that is easily accessible and does not increase social exclusion. No longer existing state borders give a rise to new social relations and extend labour market, etc.

To negative outcomes we can attribute the increasing time period that people spend browsing the Internet, thus they spend less time for communication with family. Thus new living habits form, which change not just the way of communication, but also the whole process of a human being as a personality. Lack of communication and lower level of direct socialisation between young people promote fear and they fail to express their opinion and ideas in public. Virtual environment is used for that, where the user is not asked to be identified. However all these measures can also have a negative impact. Such communities can create passive and self-confident communities where communication and relations are not directed towards productive activities.

VIII. CONCLUSION FUNCTIONAL TRANSFORMATIONS IN THE SAMPLE OF VILNIUS CITY

Development and formation of cities become more complex and multi-layered, directly dependent on the technology development speed. Urban functions form a foundation for its functional structure encompassing not only physical, but also social, economic, cultural and other environments. The expression and dispersion of urban functions in the urban structure is related to multi-layered factors preconditioning urban development process. Functional mutation is an indicator of self-contained changes in different elements of the urban structure.

The research of functional change in 1960-2009 based on three streets rout of Vilnius central parts and down-town areas identified and distinguished three basic types of functions: long-term, periodic and temporal. According to the features of functions and function mutation regularities the repulsive and drawing function models, function clusters and factors determining their formation were identified. Therefore, it follows the consequential changes that form local urban function structure, but also determines the character of urban structure. The emerged current cities situation is a basis of constant changes of functional and physical change over a long period of time. The economic and technological factors significantly affect the functions, and central parts of the city makes more attractive to tourists, but not for the residents. The functions in central parts of cities mutated and transformed affected by different factors, such as: social, economic, cultural, and technological. These factors could not be distinguished individually due to their complex effects on the

urban function dynamics and dispersion. Therefore, the basic formation principles of contemporary city are smoothly functioning networks and continuous transformations.

City centres turn to be empty and lose their significance, become as a reference of geographical centre. Therefore, the today's cities factors must be considered as a complex due to their effects on urban functions dynamics and dispersion.

Affected by the market economy, development of contemporary cities is closely related to direct vertical and horizontal interaction of factors. Functional quality of urban residential environment depends not on the presence and variety of public services, but rather on maximum quality indicators of function and equivalent territory dispersion. Modern communication technologies eliminated the isolation of suburbs, made them attractive by applying social, infrastructure systems of a large city. Thus a threat of disappearance of historical core has risen, as (a) dependency on increased seasonality and adaptation to the needs of mass tourism; (b) features of a reserve and museum appear; (c) a shortened attractive period of activities within a day and night cycle; and (d) supermarkets take over the functions of city centres.

Due to prevalent functional zonings and integrations, urban functional structures have formed ineffective functionally and, polarised urban structure, which must be verified and transformed. The regulation possibility of functions and measurable development could help to prevent problems of self-contained development or planning inefficiency. Urban functional development should be understood as a result aimed at making sustainable and integrated system, verified in a planned manner in order to satisfy residents' needs. Functional quality of urban residential environment depends on the maximum quality indicators of functions and even territory dispersion.

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