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INTERAKTYWNY PROJEKT MIASTA

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Adnotacja. W trakcie rozwoju nowoczesnych miast obserwuje się tendencję do wprowadzania przestrzeni o cechach inteligentnego środowiska; fakt ten oznacza pojawienie się nowych form procesów miejskich. Wraz z tym dokonuje się rewizji roli mieszkańca jako aktywnego twórcy przestrzeni miejskiej. Pojawienie się nowych form interakcji rodzi wyzwania związane z rozwojem nowych podejść projektowych opartych na zasadach interaktywności. W paradygmacie nowej ery cyfrowej interaktywność może dać miastom nową filozofię rozwoju, możliwość stać bliżej i bardziej zrozumiałymi. Istniejące światowe doświadczenia pokazują skuteczność technologii interaktywnej jako dodatkowej warstwy przestrzeni miejskiej, otwierającej nowe horyzonty w projektowaniu i wypełniającej luki w tkance miejskiej. Na podstawie teorii naukowej i realizowanych przykładów artykuł ujawnia genezę rozwoju relacji człowiek-miasto, a także miejsce przestrzeni interaktywnej w strukturze miasta. Badanie analizuje inteligentne technologie, które zostały wprowadzone w projektowaniu urbanistycznym i przedstawia perspektywę zjawiska interaktywności jako integralnej części współczesnego środowiska miejskiego.

Słowa kluczowe: interaktywność, środowisko interaktywne, środowisko racjonalne, projektowanie środowiska miejskiego.

INTERACTION DESIGN OF A CITY

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Abstract. There is a tendency in modern cities to produce space with smart features; this marks the emergence of new forms of urban processes. Furthermore, it involves a revision of the role of the citizen as an active creator of city space. The appearance of new forms of interaction generates issues that are related to developing new approaches for designing an interactive environment. The phenomenon of interactivity could give cities a new philosophy in the paradigm of the digital era. Existing architecture experience shows the effectiveness of interactive technologies as an additional layer of urban space, which opens new horizons in design and fills gaps in the urban fabric. Based on the scientific theory and realized examples of design, the article reveals the genesis of the development of human-city relations, as well as the place of interactive space in the structure of the city. The research analyzes intelligent technologies that were implemented in city design and outlines the prospects of interactivity as an integral part of the city environment.

Key words: Interactivity, interactive environment, intelligent environment, urban design.

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Анотація. В процесі розвитку сучасних міст спостерігається тенденція до впровадження простору з рисами розумного середовища; цей факт знаменує появу нових форм міських процесів. Водночас здійснюється перегляд ролі городянина як активного творця міського простору. Поява нових форм взаємодії породжує проблеми, пов'язані з розробкою нових підходів до проєктування, побудованих на принципах інтерактивності. В парадигмі нової цифрової ери саме інтерактивність може дати містам нову філософію розвитку, стати ближче та зрозуміліше. Наявний світовий досвід показує ефективність інтерактивних технологій як додаткового шару міського простору, який відкриває нові горизонти в дизайні та заповнює прогалини у міській тканині. На основі наукової теорії та реалізованих прикладів у статті розкривається генеза розвитку відносин між людиною та містом, а також місце інтерактивного простору в структурі міста. Дослідження аналізує інтелектуальні технології, що були впроваджені в міському дизайні, та окреслює перспективи явища інтерактивності як невіддільної частини сучасного міського середовища.

Ключові слова: Інтерактивність, інтерактивне середовище, розумне середовище, дизайн міського середовища.

Introduction. The ability to initiate and be close to significant events attracts people to the epicenters of urbanization, which are modern cities. According to the latest UN data, the world's inhabitants' ratio in urban areas accounts for more than 55% of the world's population and this figure is constantly growing. Due to this pace of development, the urban system is undergoing significant changes, which is quite natural. In parallel with the processes of urbanization appear new forms of urban dynamics, its cultural and informational saturation is raising. It is well known that cities are not only attracting, but also increasing the number of social groups, initiating the emergence of subcultures: from “rockers” and “Krishna followers” — to “gamers” and “street artists”. In the very essence of the human being, there is a craving for unity in groups, in the conditions of a modern city it manifested itself in an individual's entering into a certain subculture as a cell of personality expression. Another, but no less expressive manifestation of developed urbanization is the intervention of residents and guests in the existing macrostructure of the city, the complex matter of which has many channels of influence. In recent years, one of the most powerful channels has become software-digital interactivity — that is, the interaction of man-user with a particular function or element of the urban macrostructure in the format: a gadget — informational and multimedia objects. This type of interaction noticeably changes not only the visual face of the city but also turns the way of life itself into a more mobile, democratic, creative one. To remind us about the dependence of life forms and culture on social and technical circumstances, let us give some well-known historical facts.

The following stage of the industrial revolution of the end of the XIX century and the beginning of the XX century has brought the term “machine” into wide circulation. It began to cross a red line in all possible interpretations: art, literature, science, and even in politics. Comparison with the machine continued over the next decades in various areas of life and creativity: it is enough to mention the conceptual expression of Le Corbusier about the house as a “machine for living”, the image of the “Walking City” of a group of “Archigram” architects, works of science-fiction writer Azik Azimov, where the “machine” is an integral part of the future. Such metaphorical statements and comparisons reflect the processes that took place in those times, when indeed, with the help of powerful machine production, the urban environment has changed dramatically. The world has witnessed the appearance of the tunnels under the ground for subway and cars, still unseen electrical vehicles: trams, trolleybuses, elevators, escalators on the streets and in buildings. And all of this was associated with scientific and technological progress and its key concept of “machine”. In the twentieth century, it has lost its priority, digital revolution and IT-technologies have already started to claim the leading role. A powerful digital layer has been added to the multilayer urban space, which has outlined the new coordinates of the entire macrostructure of the city – from space management to changing its shape. The concepts of “interactive technology”, “interactive object”, “interactive advertising” have become widespread, which semantically broadcast the long-standing dream of many architectural and design theorists about the possibility of the environment “to talk” to a person, and vice versa.

It should be noted that the predictions of interactivity as a factor in the daily life of citizens coincided with the period of the birth of postmodernism in Western countries. And it was not a coincidence, because the latest

art and design trends became the expression of the post-industrial era when technology took the leading place and began to claim its own culture. Shortly it was reflected in architectural and design objects of high-tech style, but the theme of technical know-how and new media filled the pages with many publications even earlier. Thus, in 1960, the American architect and designer Kevin Lynch, in his fundamental work “The image of the city” foresight defined the influence of media on the formation of the environment, viewing the role of a human in the process of creating the fabric of the city. He defined not only the fact of “reading” the city as a book but also pointed to perceptual forms of the environment and the formation of a holistic image of the subject world in the minds of people. It was a sensible perception of the complex structure of urban planning, connected with a specific individual, who has a peculiar dialogue with the city, and in the course of which a citizen changes from a passive observer into an active participant of space building (Lynch, 1964: 62).

The role of the individual is further emphasized by the French philosopher and sociologist Henri Lefebvre. In his book “Producing Space” (Lefebvre, 2016), he formulates the concept of “the right to the city”, according to which every person has the right to explore as well as to appropriate the city, playing the role of an active participant in its construction. In modern context, the possibilities of “space creation” have been expanded, but this is the proposition that the relevance of the urban dimension (“city origin”) remains unchanged as a guarantee of a certain way of life, a state of complex structured society in which the collision of differences provides social life with new dynamics. The author of “Geomedia. Networking cities and future of public space” (McQuire, 2016), Scott McQuire, a professor at the University of Melbourne, developed the concept of Lefebvre to “the right to a networked city”. This implies the expansion, through media technologies, or social interactions, communications, as well as “cultural appropriation” (which means borrowing or partial use of already existing real objects and works of art in urban planning practices). The author notes that how we imagine and implement the digitalization and networking of public space will determine which city we will get in the future. This idea matches the concept of smart cities by Rudolf Giffinger, which states, that developing is based on the active involvement of conscious, independent, and self-determined citizens (Giffinger et al., 2010). Interaction with the environment matures an essential part of the modern urbanization structure of the city. Understanding the real value and historical connections of this phenomenon could give new opportunities for using space in a new era.

Main part.

1. The keys to interactive communication with the city

Nowadays, moving from point A to point B is not a problem. The opportunities for transport accessibility in urbanized areas are huge. A high degree of mobility extends the range of possible human movements in terms of time and space. To understand the scale of changes, one can recall Jules Verne's famous work “Around the World in 80 Days”, the protagonist of the novel got from London to Suez in Egypt in 7 days: nowadays, a flight in this direction takes about four hours. A comparison of the episode from fiction and actual data of airlines may be unacceptable in science theory, but this example demonstrates the state of the changes that have occurred. Distance as a physical dimension has not changed, but overcoming it has greatly reduced the mental distance between one place from another. At one time, the famous American architect Frank Lloyd Wright defined this phenomenon as the emergence of a new measure of space, which entails a change in the character of the human at a new rhythm of the environment (Wright, 1932). Today, a citizen has a much larger set of knowledge or keys to understanding the city. Like a detective, human reads the signs, which are rooted in his mind: traffic stops- as a connecting point between the city's arteries, a crosswalk – as a safe passage for crossing the road, numbering of buildings – as a way to organize the space of the street, etc. This is what Kevin Lynch called “legibility” – the clarity or comprehensibility of urban space, which provides recognition of its part and organizes in the related content. “as a printed page, if it's legible, can be visually grasped as a related pattern of recognizable symbols, so a legible city would be one whose districts of landmarks or pathways are easily grouped into an overall pattern” (Lynch, 1964). The new stage of “city legibility” is grounded in its transformation into a more adaptive space, where a person is an active participant in transformations proposed by the space itself. For example, the use of digital platforms fundamentally changes the shape of urban routes, choosing the best way from one point to another, avoiding traffic jams, bad roads, possible strikes of a workers and so on. Each act of being in space can generate data, leaving a digital trail. It can be a route using GPS technology, or a photo on Instagram with a tag marked geolocation. They act as a kind of digital key to understanding the layered fabric of the city, which can be read much easier, despite the language environment and orientation in space. Mental maps of the city are also being expanded (according to Lynch), which are formed by basing on purely internal signs of space for the inhabitants of a certain territory, where anything can serve as a reference point: from a giant stone in the middle of the square to an ancient, half-destroyed tower. These signs are well known absolutely to everyone. All you need is to remember the particular characteristics of the surroundings, the place where you agree to meet your friends for going to the gym together or have a glass of beer. Perhaps it is a beautiful monument or a cozy square with certain memories which are related to memory, a transport stop or a crossroad of streets. Every person has their mental maps and their vision of space. Under the influence of digital technology, mental maps are changed in their structure. Today, without unnecessary arrangements, you can make an appointment in an unfamiliar place and instantly send geolocation and photo from your smartphone, so that the person you are waiting for will find you quickly. The speed at which our lives are filled with interactivity is impressive. Thus, in 2004 the Open Street Map service was launched, the goal was to get a free map of the world, relying on volunteers from GPS devices. The popularity of the service stimulated the emergence of new products: in 2008 appears a similar tool Google Map Maker, in 2010 - folk maps of Yandex, and then several similar services,

which provide users the opportunity to independently modify and correct map information from different countries and cities. Everyone got not only a real opportunity to see the city more deeply and open a part of the secret passages of locals, but also to adjust the content, change the digital trace on the map, providing it with personal shades. The convergence of cartographic services with the social environment has led to a powerful boom in activity and pushed the relevant structures to a new stage of optimization of life processes. Against this background, the psychological self-identification of the citizens grew, which began to feel a certain link in the interactive organism of the city.

2. Interactive technologies in the new paradigm of the city

Walking around the old cities and looking at architectural monuments, we become spectators of a unique archive of records, which are transmitted in the shape of relevant signs and forms of a past age. Perceiving “architecture as frozen music”, we subconsciously compare it with the subject space of a modern city, noticing changes in the vector of development in the direction of acquiring the characteristics of interactivity. The digital world is redefining the culture of using space, forcing it to adapt to new scales and speed of interaction. The logic of the process lies in a simple materialistic truth: “The environment is forming a human being”. Nowadays, you can write a review at almost every city food facility, email the mayor or trace the route of an ordered taxi. Interactive technologies are actively used in the design of web-interfaces, and intelligent technologies help the consumer, as the intended receiver of goods or services, to navigate the space of the web page. Thanks to intellectual technologies the transition from statistical data as an archive, was in the past epoch, to instantaneous analysis of the situation, it allows to predict the needs and future actions of the user. The authors of the article “The Future of Interactive Marketing” from Harvard Business Review define interactivity as the ability to address a person and the ability to collect and remember the answers of this person (Sorrell et al., 1996). Interactivity is a “two-way information flow”, so it can take the form of a call, chat, game or an infinite number of other iterations. The privilege of interactivity is no longer a feature of living beings. It should be noted that the fight for customer attention is taking place on many levels, and these technologies serve not only social and cultural needs but are largely borrowed by the sphere of marketing for advertising and profit. In the urban infrastructure, advertising was one of the first areas where interactive technologies were adopted, which led to a new turn in the development of seller-buyer relations. In the structure of the city, it resulted in a new type of presentation of information, when the usual one-way communication with the potential consumer of the product or service has changed to two-sided. Such advertising became more attractive to the consumer because it included him/her in a certain process of interaction with a product, firm, or brand (Boichuk et al., 2018). The experience of introduction interactive objects into the city structure accumulated during the last years has outlined the next horizons and forms of development of this sphere. The usual attributes of advertising have received the possibility of active interaction with an environment, and the newest design solutions have undergone interesting transformations. For example, the project by the advertising agency “N = 5”, carried out at the request of a network of sports facilities “Fitness First”, significantly transformed the usual bus stop in Amsterdam, giving it control of passenger weight. While waiting for the city bus, a person sits on a bench with a measuring build-in device and can immediately observe his or her weight on the display.

Interaction with the object at the biophysical level encourages the user to think about his or her fitness, which is the goal of this project. Also, advertising can be not only a commercial catalyst for shopping but also a way to draw attention to certain social issues. This approach is illustrated by the project “It Happens When Nobody Is Watching” for Amnesty International, which was created to highlight the problem of domestic violence. Depending on the spectator’s view, the camera changes the display of the photo, thus bringing information to the community.

The more powerful is the person’s participation in the interactive process, the deeper and more serious it will be the feeling of cooperation and pleasure in the process of implementation of the advertisement. Therefore, an important factor of interactivity is the role of the artist (designer, architect, and artist) in motivating citizens to

participate actively in the transformation of the city. The powerful potential of design in the process of improving the modern cities underlined by international and Ukrainian scientists, designers and artists (Harvey, 2008), (Sklyarenko, 2014), (Svirko et al., 2016). At the same time, the concept of “land improvement” is considered in a broad format of factors: from the ergonomics of transport stops — to the subject storage of digital information, elements of landscape design, which constitute the “video ecology of the urban environment”. (i.e. the qualities of visual perception of public space). Considering the problem of “city recovery”, the authors of the book “Design activity: ecological design” point out that “mobile and easily replaceable elements of urban design create a sort of buffer between a person and high-rise buildings, setting the appropriate scale, providing functional needs and introducing artistic-composite and visually semantic components in this



Fig. 1. Fitness First's giant scales at bus stops display your weight

dialogue” (Svirko et al., 2016). The role of the designer in the question of synthesizing digital technologies and social communications, where interactivity acts as a multilevel characteristic and is structured into a design system by sharing information, objects, feelings, emphasized by Natalia Sklyarenko in her article (Sklyarenko, 2014). The importance of interactive technologies that “turn the pages of the city’s history to a new stage of existence” and have great potential for transformation in society, points out to the author of socially directed essays, the famous Anglo-American intellectual David Harvey. He writes: “The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. The freedom to make and remake our cities and ourselves is, I want to argue, one of the most precious yet most neglected of our human rights” (Harvey, 2008). Interactivity can be a factor that reinvents the city, create a dialogue between the divided poles. City initiatives are actively launched through digital networks, where audience response can be tracked and receive feedback. For example, the city of Melbourne, Australia, has installed water consumption and water stress sensors on 70,000 trees in parks, public gardens and streets to care about green spaces. The ability to quickly obtain information about the necessity for timely irrigation is essential, as the area is a man-made forest on the site were used to be a desert. That is why the trees need additional watering in times of extreme heat. In addition to automated irrigation with a “tree claim”, a user from anywhere in the world can go to the site melbourneurbanforestvisual.com.au, where they can find a map with applied trees of Melbourne. If you point the cursor at the mark, you can get information about the breed, the current state of the tree and send an e-mail with comments, wishes, and requests to the specialists of the planting service.



Fig. 2. Interactive ad. for “Amnesty International
“It Happens When Nobody Is Watching”

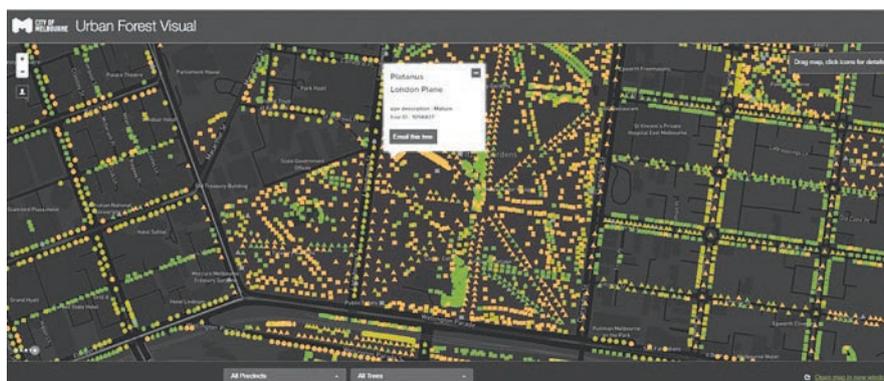


Fig. 3. Individual tree data for City of Melbourne

Thus, the green space of the Australian city begins to be socially significant, and in the context of interactivity shows the act of appropriation of space (according to Lefebvre), the gaining of personal attitude to the public object and the impact on it. This effect works in both directions: if we begin to feel a part of a particular space, i.e. an owner or co-owner, the value of the environment will increase significantly. Understanding the possibilities of interactivity leads to a new paradigm of urban life. By accepting and understanding the opportunities that the environment offers us, we can shape it according to other principles. For example, a street in London's West End has been transformed into the world's first energy-saving “smart” street by a special sidewalk (from Pavegen) that produces energy. Moreover, pedestrians walking along Bird Street can run a special app on their smartphone and see how much energy they have created with their steps. One step on a 45×60 centimeter tile can generate about 7 W of electricity, depending on the weight of a person. Five percent of the energy that is produced is used to turn on the tile backlight, and 95 percent is sent to batteries or used for other purposes. London's Bird Street also has “CleanAir” benches, developed by “Airlabs”, which can absorb nitrogen dioxin, thus purifying the air.

The spread of this technology to active pedestrian areas and transport hubs is prospective, especially from an environmental perspective. By supporting the environmental movement of society, the leadership of many cities around the world is taking steps towards a sustainable future by innovative reconstructing roads and technically tuning them to a source of alternative energy. Similar solutions, in which interactive innovations are attractive,



Fig. 4. Smart street by Pavegen

convenient and environmentally friendly, have been implemented already in the huge international airports of London and Abu Dhabi. As for smaller projects, the number is very large and is increasing day by day.

Conclusions. The above-mentioned theoretical works and practical examples demonstrate the rapid and irreversible processes of entering interactivity into the modern fabric of the city. Interactivity becomes a link between many spheres of life, directing urban design to the search for new paradigms of creativity and new dimensions of aesthetics of the subject space. Finally, it teaches, warns, amuses, generates energy, fills in the gaps of the urban structure and allows people to feel themselves a real part of the environment.

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