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The Impact of Information Technology on the Appearance and Usage of the Contemporary Open Spaces

Anna CZINKÓCZKY, András Béla OLÁH

Department of Garden- and Open Space Design
Faculty of Landscape Architecture
Corvinus University of Budapest
e-mail: anna.czinkóczky@uni-corvinus.hu, olah.andras.bela@gmail.com

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Abstract: The development of Information Technology has made a significant impact on the appearance and usage of open and public spaces. The urban community spaces are not exempt from the tremendous effect of the digital technology, and Internet penetration. The design of the future open and public spaces should incorporate the new demand of the digital revolution. This research features the main elements of this demand and its existing effects, to help designing the open space designing in the future.

Keywords: open space transition, digital revolution, interactivity

1. Introduction

The Information Technology (IT) [1] has radically changed and transformed all areas of everyday life including the most common activities. Consequently, the open spaces are not exempt from this tendency and their appearance and usage have been transformed very dramatically.

Obviously the change due to IT is the most momentous in those areas, which are the primary results of human activity and lifestyle. These are the urban areas belonging to the densely built-in urban fabrics, downtowns, open spaces and public squares. This development is due to the fact that IT has been changing the features of the open spaces for many decades, there exist such urban open spaces nowadays

which would be almost useless and non-functioning properly without the presence IT technology. Hence we can say that the contribution of IT to the functionality of open spaces can be essential in current times.

The relationship between IT and urban spaces and the urban lifestyle is very complex and it contains multiple feedbacks. One can observe such relationships between these factors; the IT, the urban population and the environment (urban open spaces). *Fig. 1.* The lot of cross relationships complicate these interactions even further, since the connections between these factors are multilateral (for example if there appears a new establishment on a public square and it is being advertised on social websites, as well. As a result of the advertising, more and more people (usually young ones) visit the given public square, which triggers the physical development and the appearance of new establishments on the public square, that can have a new impact on the social websites etc.

We can see that these factors can interact and enhance their individual effect.

2. Materials and Methods

As it was mentioned above, this is a very complex interaction, since it has many actors with multiple feedbacks, consequently the analysis can be very complicated. The essence of our measuring method was to consider the most emblematic examples concerning the connection between the IT and the urban open spaces.

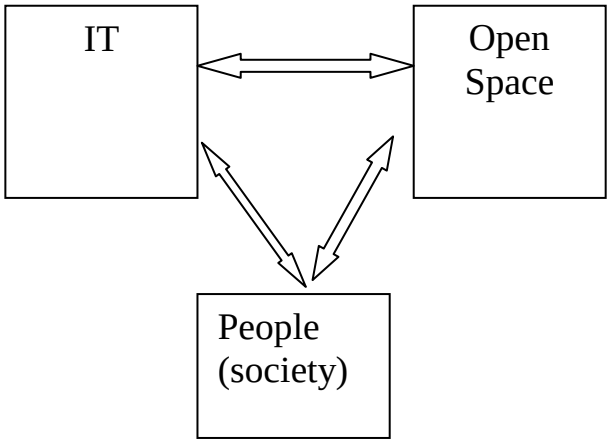

Figure 1: The main actors of this interaction

In case of a given emblematic example the entire history of it must be reconstructed from the first appearance of the IT on that site till present days. It is

very important to emphasize the examination of the interactions between these three actors, the IT, Society (S) and the physical open urban space (O) during the analysis of the story of the given site.

Emblematic example can be not only a public square, but it can mean a new functionality of the open space, a new way of usage, which is evolved only because of the effect of the IT.

And as a consequence of this, the open space will be absolutely transformed.

Our examinations were made on two main levels. On the first level the direct, immediate effects of the IT on the open spaces are examined. The first level effects basically included facade and new design elements and functional changes and light effects, which occurred due to the IT and which resulted the remarkable change of the given urban open space. The other level is the indirect or the intermediate effect, which is due to the fact that the IT changes the mental map and knowledge of the people of the given open space. *Fig. 2.*

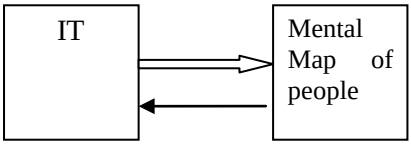

Figure 2: The effect of the IT on the mental map of people

The essence of this is that that everyone has its own subjective knowledge about the given place and this knowledge comes from the collected information about it. If the greatest part of this knowledge is IT related, then it can be concluded that IT is the strongest shaping factor of the knowledge about this given place in the collective mind of the society.

3. Results and discussions

3.1. Sound

On the first level of our examinations there will be examined the direct effect of the IT on open spaces. First of all there must be two notable examples mentioned, which show how can momentous IT developments transform radically the usage and the facade of open urban spaces.

The first example is the development of the sound technology. Prior to the Greek amphitheatre it was impossible to have audio shows for thousands of people simultaneously, due to the lack of proper sound amplification. The only possibility to hear unamplified human voice was to create specially shaped open spaces with excellent acoustics and this was achieved by people who stood on a well localized point (focus point) and talked loudly of the open space could be heard very well on the whole territory of the open space. This only functional requirement (proper acoustics) absolutely determined the facade and the and appearance of the given open space. This resulted is the widely known ancient Greek theatre. *Fig. 3.*

Figure 3: The classic Greek theatre

On the other hand, nowadays it is possible to construct microphone systems integrated into the building elements of the given open space with the help of the development of the electronic sound systems (IT). Due to this fact today the natural acoustic features of the given urban open space are absolutely not important. Hence, it is possible to design the given place to an arbitrary shape and capacity without compromising the quality of sound. Thus Information Technology can serve as a magic "trick" to achieve perfect acoustics for any kind of open space.
A very good example for this is the performance of the central part of the Millenium Park [2] in Chicago. In this case a huge plain area is covered by a steel (pergola like) net structure, whose shading function is negligible, but it contains a built in microphone system and due to it is possible to achieve a good quality sound amplification within the entire zone. *Fig. 4.*

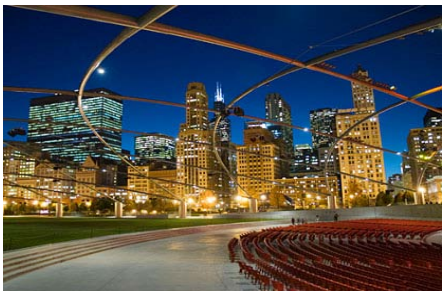

Figure 4: The pergola like microphone system over the Millenium Park

3.2. Visual performances, outdoor projections

The IT related electronic projecting systems have also contributed to the appearance change of the open urban spaces. This phenomenon is relatively old, the first such electronic outdoor projection was on a billboard in 1936 during the presidential election campaign on the Times Square, New York, USA [3]. This is a remarkable example for the interaction between the society and the IT, because the the winner of this election was Theodore Roosevelt and his picture was projected electronically (!) onto this billboard. The Times Square itself, as it will be presented later, has become one of the most emblematic squares of the world as a result of the IT revolution.

After the first outdoor projection the IT has spread out in the world extremely rapidly (electronic advertisement) and radically transformed the open spaces and increased the functionality and usage possibilities to an extent unknown before. For example the possibilities of constructing drive-in movies, open space movies and projections created a new form of outdoor recreation.

3.3. Light art, light painting, webcam painting

The term light painting also encompasses images lit from outside the frame with hand-held light sources. The first known photographer to use this technique was Man Ray in his series “Space Writing” created in 1935.

A technique known from light art is to project images on to irregular surfaces (faces, bodies, buildings etc.), in effect “painting” them with light. A photograph or other fixed portrayal of the resulting image is then made.

Fig. 5. [4] shows an example where light art changes the appearance of a traditional building. It is important to note that in these cases the clear border between the public and the private spaces is not so clear, because of these

projecting surfaces, billboards are usually placed on private plots or on the facade of private buildings, but they can be "used", seen, read or even heard by anybody which is a typical function of public spaces.

We can say that IT also transforms the ownership: it can make public spaces private or private spaces public. *Fig.6.*

Figure 5: Light painting on the facade of the Március. 15. Square, Budapest

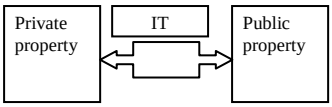

Figure 6: The effect of the IT on the ownership

3.4. Times Square, NY

The most important public square, which was most influenced by the IT is the Times Square in New York, USA. Times Square, nicknamed "The Crossroads of the World" and "The Great White Way", has achieved the status of an iconic world landmark and is a symbol of New York City and the United States. It was mainly built in the early 20th century and from the classical point of view it cannot be considered a "square", rather a traffic hub or just a road-fork. On the old photos it can be clearly seen that its traffic function was the primary use. As *Fig. 7.* shows it gains its "square" attribute only because of the momentous pedestrian traffic and due to the remarkable surrounding buildings (Times Tower, Knickerbocker Hotel). This was changed suddenly by the appearance of the first electronic billboard in 1936, and shortly after this, practically even in the 50ies the main feature of this square was determined by these electronic advertisement tools.

It is very important to note that in the traditional sense this is not a "real", viable square. The roadways are dominant, only sidewalks are provided for the pedestrians, the square is always congested. From the ecological aspect this square is a "disaster"

hence it is completely paved and there is no plants, no trees or any type vegetation found. Only the artificial shape of the square is absolutely dominant.

Figure 7: The Times Square at the beginning of the 20th Century

But the essence of this square is not the buildings, because they are serving only to hold electronic billboards and advertisements. On the whole world this is the only public square, where all apartment owners must (!) put a kind of advertisement onto the facade of his/her flat. This absolutely determines the feature of this square, even the original emblematic buildings cannot be seen any more. Its only traditional function is the traffic, but nowadays the traffic has become less important. The major function of this square is the touristic and cultural attraction, which is provided by the the vast number of the electronic billboards, an application of IT. *Fig. 8.*

Figure 8: The Times Square in present days

3.4. Urban traffic management (UTMC) with IT

The second level of our examination was the mediated or indirect effects of the IT related to urban open spaces. Modern urban traffic management (i.e. GPS combined track planning tools) cannot be realized without IT. UTMC systems are designed to allow the different applications used within modern traffic management systems to communicate and share information with each other. This allows previously disparate data from multiple sources such as smart phones, car parks, traffic signals, air quality monitoring stations and meteorological data, to be amalgamated into a central console or database. The idea behind UTMC is to maximise road network potential to create a more robust and intelligent system that can be used to meet current and future management requirements.

3.5. Effects of Internet and social media

In addition to the previous factors it is very important that real urban open spaces can appear in virtual space on the internet [5]. An example for this that the some important well-known open spaces, squares have already appeared on social websites. *Fig. 9.*

Figure 9: The site of the Times Square on a well known social homepage

This means that the urban people, who mostly spend their time in front of their computers connected to the Internet obtain their information and knowledge mainly from Internet or visiting urban open spaces in person.

But the revolutionary change did not stop here. Current websites (Web 2.0. or social web) also change the way that urban spaces is visited or perceived.

The so called flash-mob [6] is an example for this. A flash-mob activity can not be defined exactly, but it has some typical attributes:

- it is absolutely organized on Internet;
- it is an annual phenomena (sometimes its duration is only a few minutes)

- usually there are a huge number of participants
- these participants appear on a well located public space (public square, metro station etc.)
- in a well located time
- the participants start to make the same (usually strange) thing in that well located time point
- most of the participants do not know each other immediately, but there exist (usually internet mediated) connections among them.

The government and the local governments do no like such phenomenas, because of the unexpectedness of such events. It can block the traffic or cause congestion. Social web has a great organizing power. This can result in a radical transformation of the social structure (recent revolution in Egypt organized on Facebook).

IT will transform open urban spaces even further. Interactivity will be more relevant, users can change the appearance of spaces with their mobile phones (light graffiti). *Fig. 10.*

Figure 10: Cell phone controlled projections

4. Conclusion

The development of the IT is very rapid and its effect on urban open spaces and society is very significant and it can be anticipated that on the long term it will be revolutionary. Considering the architects, designers, urban planners they have to integrate IT with the traditional functionality. Furthermore they have to design

open spaces which are flexible and interactive or at least which can be turned into flexible and interactive open spaces to serve the new demands of the urban societies.

Acknowledgements

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