The Contribution of ICT in Planning of Public Open Spaces
Reflections on the City of Lisbon

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Abstract – *This paper discusses the importance of open public spaces, and how information and communication technologies (ICTs) can enhance the understanding of the relationship between spaces and their users, towards the production of inclusive and cohesive urban spaces. The analysis is built on the Project CyberParks, which aims to increase the knowledge about this challenging relationship. Through this, we intend to analyse how these digital forms of communication can help planners improve public open spaces, based on the study case of Lisbon.*

The growth of our cities, throughout history, has always been linked to the public space, and how it was built. Its function was constantly changing, according to the needs that were appearing at different times. However, these transformations were being made with one goal, that of adapting public spaces to their users. What currently occurs is almost an extension of the existing public spaces, by the appearance of enclosed public spaces, for example. And we have some theories that suggest the Internet as a public space.

Nowadays, the use of new technologies is becoming a reality. It is already possible to find public places with free Internet access, often providing an attraction for tourists. It is very common to observe individuals who have smartphones and other portable technologies that are constantly connected to the Internet.

The discussion will be centred on the contribution that ICTs could have to help plan public open spaces, with the presentation of some examples of experiences made with ICTs on improvements of these public spaces. With the technological growth that we have observed, ICT must be used to both improve the participatory methods, and act as a tool to bring people to be more outdoors and use public spaces.

Keywords — public open space, information and communication technologies, users of public space, urban planning, CyberParks.

I. INTRODUCTION

Throughout this paper, we intend to analyse the relationship between digital communication technologies and public open spaces, and how the new forms of communication can be a support to different makers, in order to plan better urban areas. The analysis is based

on the work developed by the COST Action TU 1306 CyberParks, which aims to advance knowledge about the relationship between Information and Communication Technologies (ICT) and Public Spaces, and is focused on studies carried out in Lisbon.

The CyberParks Project establishes an interdisciplinary research platform, including different specific groups working together to understand the relationship between ICT and the production and use of public open spaces, and the relevance to sustainable urban development. In this paper, the studies developed in the City of Lisbon will be addressed, namely comprising the tests of the WAY CyberParks application.

The WAY CyberParks is an ICT tool for monitoring the use of public open spaces that is being developed and tested, consisting of three main elements: a smartphone application (app), a set of web services and the cloud. In Lisbon, this app has been used in some places, namely in Quinta das Conchas Park. A Workshop was held in September 2015, as part of the European Researchers Night. The paper is an analysis of the results obtained, of the app's potential, and of how this type of digital form can help planners to improve public open spaces.

The public open spaces of a city have always been part of its identity. Moreover, the development of our cities has always been conditioned by the type of public space. Different types of public open spaces necessarily imply different growths. Several authors make reference to the important need for communities to have attractive and inclusive public spaces.

Public open spaces must be prepared to receive the community, where their relationship can be strengthened, and a sense of belonging cloud be fostered. They are representative spaces, with a civic and political action [1] , and that have the function to condition the economic development and drive environmental sustainability [2].

Nowadays, it is usual to see people using digital communication devices in public spaces, as smartphones or tablets for phoning, reading, searching, sending emails, taking pictures and making movies, and so forth. This is a big challenge to the different specialists, from ICT developers to social scientists and urban designers [3]. The challenge is to be able to use these new forms of communication and use them as a tool to support decision making in planning, production, and maintenance of public spaces. For that, it is necessary to create tools that can be used by the users, and could access users' needs in a public open space.

By having access to the needs of the users, it is easier to find solutions for the different spaces, making them more suitable to the respective needs, thus resulting in an increase in the tool's use. And given the way our society has developed, where leisure time is increasingly reduced, it is essential to create more inclusive spaces and adapted to the needs of its users, reversing the trend of people being locked at home, in their virtual world.

The challenge could be summarised by a key question posed by Thomas [4] in her blog: "Can we capitalise on our new-found love of the wired life to encourage more people to go outside?" Could we use this relation with ICTs to bring more people to the street and the public space?

II. THE CONTRIBUTION OF ICT IN PLANNING OF PUBLIC OPEN SPACES

One of the principles of the "New Charter of Athens", revised in 2003 [5], refers specifically to the use of new information and communication technologies (ICT). This is in line with the objectives of CyberParks. The leading questions in CyberParks Project are: 1) What is the contribution of ICT to transform our cities into more social and inclusive environments, rather than just more high-tech?; 2) What opportunities does ICT offer to better understand the way people use the public spaces?; and 3) How can ICT provide support for those involved in the production, design, and maintenance of public spaces? [6]

Using this new ICT, decision-makers have the possibility to understand the needs of communities, and make changes in order to bring more users to public spaces. In some cases, these needs are new, supported by new ways of life. The role of decision-makers is to understand these needs, and create public spaces that are more attractive. The use of ICT in planning of public open spaces must be seen in two ways: 1) as a support to the study and technical development (production); and 2) as a tool to be used by the community, in order to improve public participation in the planning proposals, and in the promotion and exchange of knowledge [3].

According to Thomas [4], the world is increasingly dependent on digital technology. The digital penetration in our outdoor lives is quite high, and it is envisaged to become stronger So, we must take this research opportunity and create a tool to study public open spaces. Also, the possibility of interaction with the users provides a new way of communication, which is much more effective and fast, achieving in this way an interaction with users, not only realizing their needs, as well as interacting with possible solutions. Thus, the ability to plan a more attractive and adequate space it is the priority

Together with other means that may be considered by planners, ICT can be a good tool to improve the way planners work. However, we must not consider this as being the only way to provide data. Fieldwork, for instance, cannot fail to be considered. But ICT has some important benefits for those who need to plan and study a space.

In this paper, we shall describe one of the existing tools that can be used by planners to support the decisions and the planning of public open spaces. As discussed above, the tool is WAY CyberParks application (app), an ICT tool for monitoring the use of public open spaces, which is being developed and tested and which consists of three main elements: a smartphone application (app), a set of web services and the cloud. The users of the app have the possibility to send information about a space, by using different tools provided, such as their GPS location that allows seeing the routes used the suggestion box, and specific information resulting from questions that may be undertaken.

III. REFLECTIONS ON THE CITY OF LISBON

Inserted in the CyberParks Project, and similar to other countries involved in the project, some studies in Lisbon have been developed, which aim to analyse the way ICT can be

used in the planning of public open spaces. Although in this article it is intended to give more prominence to the workshop held last September at Quinta das Conchas Park, other activities that have been carried out are also noted.

The first studies to be conducted concerned the tests in the Quinta das Conchas Park and Príncipe Real Garden, during the first meeting of Cyberparks in June 2014. At the time it was possible, using the participants of the meeting, to carry out some observation tests of both places. In each of the spaces, the participants had to answer a questionnaire on paper, which aimed to understand how they used each of the sites, which routes were adopted, and their opinion regarding the use of a digital tool – in the case of Quinta das Conchas this comprised the WAY CyberParks, while the use of GPS was used at Príncipe Real Garden. Participants were asked to complete the questionnaire at the end of the visit.

Unfortunately it was not possible to access data collected by the app WAY CyberParks through the Web platform, and therefore only the data collected by GPS devices became available. The data analysis enabled the confirmation of an interaction between what is real and what is virtual, and their complementarity. Using GPS devices confirmed a trend: attractive spaces, a pleasant atmosphere, an inviting space that offers different possibilities for activities tend to be used more and more often by individuals who spend more time on site – in short, what can contribute to greater social coexistence with all its implications, such as identification, sense of belonging, social integration, etc.

Subsequent to this activity, other spaces are being prepared some in order to be analysed in more depth, using the app WAY CyberParks. Among these sites are the Quinta das Conchas Park, and a rehabilitated neighbourhood called Ameixoeira. The more advanced preparation is Quinta das Conchas Park, where tests have already been made. One of the tests was the workshop, inserted in the European Researchers Night, and the results are presented below.

IV. WORKSHOP QUINTA DAS CONCHAS PARK – RESULTS

The Researchers' Night is an initiative promoted since 2005 by the European Commission under the Marie Curie Actions, in order to celebrate the Science and approaching citizens. Taking advantage of the possibility of CyberParks Project to join this initiative, some of its members were present during the evening on the 25 September 2015, in order to disseminate the project among citizens, as well as other research groups, and within the activities developed before this event, there was a workshop called "WAY CyberParks app – Há Ciência em Lisboa" (WAY CyberParks app - There Science in Lisbon).

The organizers and representatives of CyberParks Project were CeiED / ULHT (Interdisciplinary Centre for Studies in Education and Development / Lusófona University) and LNEC (National Civil Engineering Laboratory), with the involvement of four researchers: Carlos Smaniotto, Diogo Mateus, Marluci Menezes and Tiago Duarte.

The workshop had 15 participants, and aimed to test the application WAY CyberParks. Despite the number of participants, only 9 used the app, after having created groups. The collected results were processed and analysed, and presented in the Researchers' Night held on September 25, and each participant could verify the tool's potential, and their participation in the project.

The proposed workshop included the following steps:
1. Description of WAY CyberParks, its features and objectives of the Workshop;
2. Visit to Quinta das Conchas Park, wherein each participant was asked to use the freeform space, requesting only to test WAY CyberParks during the visit;
3. At the end of the visit to the park, participants were asked to answer a short questionnaire about the use of WAY CyberParks.

As mentioned above, the results were presented at the Researchers' Night.

The data collected in the workshop was as follows:
· Tracks / routes of each user;
· Information placed in the suggestion box of app;
· WAY CyberParks questionnaire, about the visited space;
· Written questionnaire on the use of WAY CyberParks.

Thus, the collection of this information was intended to test the different features of WAY CyberParks, and obtain an analysis of the participants on the use of this application. Of all features, the answers given by the users of WAY CyberParks questionnaire were not available, due to an informatics problem that prevented the collection and appropriate storage of information provided by users/participants.

A. Tracks / routes of each user

WAY CyberParks main function is the tracking of users on a particular public space, using for this purpose the GPS embedded in smartphones, giving the location of each of the real-time users. This function has the main advantage to understand how users use the public space, which routes they adopt, as well as the duration and distance travelled by them.

Through the results, we can observe the areas of public space with more or less occupation, and the timeline associated with them, for example. This type of analysis can provide several indicators, such as the quality of each of the public space areas, thus helping assess possible measures to be taken to improve some places that do not have, or having a reduced, occupancy.

In the specific case of the Quinta das Conchas Workshop, although the area under study contemplated the total area of the Quinta das Conchas and Quinta dos Lilases, we found that participants/users remained for a longer period of time in the central area of Quinta das Conchas, and the more used route was between this central area and the lake of Quinta dos Lilases. The forest area in the east of Quinta das Conchas had a practically nil

use. The reasons for this type of use could be various, and can be explained by the very specific type of users, which in most cases occurred in a group, thus seeking more populated areas of the study area, unlike the North area of Quinta das Conchas, that provides a quiet and isolated stay, and that forest, which has a predominance of users who practice sports, such as running. In the specific case of Lilases, mostly characterised by isolated stay, it was found that only its central area was used, as a passageway.

It is possible to see in Figure 1 an example of the route travelled by a user, and in Figure 2 the behavioural map of the most used routes. It should be noted that this information is available automatically on the Web service of WAY CyberParks app.

Fig. 1: Website WAY CyberParks (http://services.cyberparks-project.eu/): user route and distance travelled.

Fig. 2: Website WAY CyberParks (http://services.cyberparks-project.eu/): behavioural map.

In the specific case of this Workshop, the duration of the route was similar for all users, not allowing one to draw conclusions, a normal situation because it is an event like a set schedule. Moreover, it was found that the distance covered on average was 3.000 m, and that the shortest distance travelled by a user / participant was 1.575 m, up until 5.181 m, and in this particular case also moved to an area outside the selected location.

Briefly presenting some observations of this feature:
- Participants have chosen to go mostly to the central area of Quinta das Conchas;
- The forest area was only covered by a participant (area dominated by users who practice sports);
- The average distance travelled by participants was 3.000m;
- The average duration of the visit was 2.5 hours (Workshop duration).

B. Information placed in the suggestion box of app

One of the features of WAY CyberParks is sending suggestions in the form of text, image, video or sound, which will be sent to a web platform, further processed and analysed, enabling the development of actions to improve the use of public space.

In the case of the held Workshop, participants were encouraged to use this tool in order to indicate the strengths and weaknesses observed. The sound sending functionality was the only one that was not used. This feature was also used to support the quiz app, where a specific response was necessary, according to a previously selected option. Since it was not possible to access the results of this questionnaire, we cannot associate the suggestions with the answers given, and which ones were made spontaneously. Table 1 illustrates the type of suggestions that have been made, in particular regarding the type (positive or negative suggestion), the given title, and the form used for sending (text, image, video and/or sound).

As mentioned above, the sound feature was not used and only a video was placed. Most suggestions were made through text and image, and the use of text and image on the same suggestion was the most used option.

In summary, regarding the use of this feature, we have:
- Functionality with a relevant use = 17 uses;
- Most of the uses served to observe negative points = 11 (about 65%);
- Only one equipment suggestion was sent;
- It allows the researchers to check quickly and easily the opinions of users regarding the public space

TABLE I. SUGGESTIONS PLACED IN THE APP

TYPE	TITLE	TEXT	IMAGE	VIDEO	SOUND
Suggestion	bench + bin quinta das conchas	as above	Yes	No	No
Negative Point	land flooded	Sprinkler has flooded lawn.	Yes	No	No
Negative Point	Ground	The ground is very dry, very brown	Yes	No	No
Negative Point	Dirtiness	Many cobwebs on the boards.	Yes	No	No
Negative Point	Trash	There is some trash on the floor	Yes	No	No
Negative Point	dry lake	quinta dos lilases lake is no water	Yes	No	No
Negative Point	picnic area	picnic area completely cold and empty of life. it's not attractive to use.	No	No	No
Negative Point	play areas	play areas vandalized	Yes	No	No
Negative Point	Lake and surrounding area	This lake does not look any lake. The area is not attractive to sit or rest. It's ugly and nothing attractive. It looks abandoned.	Yes	No	No
Positive Point	drinking fountain	Positive point of park.	Yes	No	No
Negative Point	Quinta dos lilases	Quinta dos Lilases does not seems to be managed by the same entity of the Quinta das Conchas due to their degradation and lack of maintenance.	No	No	No
Negative Point	Quinta dos Lilases Park	Park needs more maintenance	No	No	No
Positive Point	watercourses	No	Yes	No	No
Positive Point	futebol	No	Yes	No	No
Positive Point	futebol video	No	No	Yes	No
Positive Point	lampost	lamp	Yes	No	No
Negative Point	Lack of cleanliness	Take some firewood	Yes	No	No

C. WAY CyberParks questionnaire about the visited space

One of the objectives of the participants in the workshop was to respond to questions on the WAY CyberParks app. The questions were distributed throughout the study area, and were automatically activated when each user passed through their area of influence. The answers to these questions were intended to ascertain the views of different participants, concerning various aspects, from the sense of security of certain areas to framing the type of user, in particular the way that was taken to the park and the distance from where they lived, among others.

The questions included in the WAY CyberParks are indicated below:
- What is the reason for your visit to the park?
- How often do you use the park?
- How long do you usually remain in the park?
- What is the distance from your residence?

- What route do you use most often to go to the park?
- Do you consider that existing buildings (cafe, restaurant) are well framed in the Park?
- Is the playground well framed in the Park?
- Do you consider that the playground could be improved?
- What elements do you like most in the park?
- How do you rate the degree of safety of the park?
- Do you consider that those who live near the Park have better living conditions?
- Do you consider this large grassed area to be suitable to the park?
- Do you consider the waterlines to be an attraction for the park?
- Do you consider that the internal paths of the park are well distributed?

A few more questions were asked in the proximity of some places, asking respondents' opinion if, for instance, they liked the lake and the picnic area.

Unfortunately, we could not get the answers given by the users because of a computer problem associated with the WAY CyberParks web service. It is to be noted that the associated problems have already been solved, allowing one to conclude that this event is not likely to happen again. Although it has not allowed us to obtain answers, because it is a feature that was to be experienced for the first time in this particular place, the result of the on site analysis through conversations with participants allow us to make some other observations that should be considered for future situations.

First, there is no user who has answered all the questions. Although respondents have not gone through all the areas where the questions were, the main reason given for non--response is related to the failure to realize that the notification was in the question's range, and after checking that it appeared in the app, since the users were already out of this range, it was no longer permitted to answer. Once the location of the questions was not the knowledge of the participants, they could not go back to where this question had been launched.

Although not answering all the questions cannot be considered a negative aspect, it should nevertheless be the subject of reflection, and in particular with regard to: 1) the number of issues; 2) their distribution over space; and 3) possibility for users to have access to the location of questions (as in points of interest).

D. Written questionnaire on the use of WAY CyberParks

Taking advantage of the fact that this was a workshop with a group of previously registered people, and in order to obtain information about WAY CyberParks app, and possible aspects to improve, a written questionnaire allowed us to collect this type of information. The questionnaire was provided to participants at the end of the workshop, and answered on site. We have 13 questionnaires that were completed, with a collaboration of 54% men and 46% women, emphasizing a balance between sexes. In terms of age of the participants we find that the average age was 28 years, with the most older participant having 42 years

and the youngest 12 years. The predominant age group was 20-29 years, within the average age mentioned above. The results in each of the questions are shown below.

Question 1: How do you rate the use of the WAY CyberParks application?

The results indicate that none of the participants considered the use of WAY CyberParks difficult or extremely difficult. Still, a percentage of 23.1% considered its use only reasonable, the same percentage considered it to be very easy. Most users consider the use of easy application. The results obtained in this question (as well as others) are of great importance because of the need to have an application that is easy for users to understand, and it is desirable that they use it without any aids, as was done in this Workshop. The positive results obtained allow us to conclude that the group of participants considered that the application WAY CyberParks is easy to use.
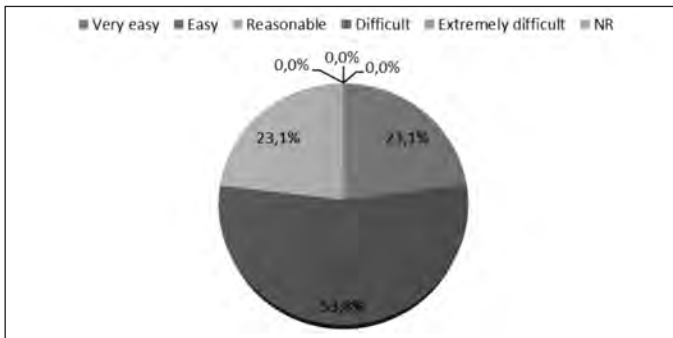
Graphic 1: How do you rate the use of the application CyberParks WAY?

Question 2: Do you consider that interesting and relevant questions were posed by the application WAY CyberParks along the way?

Another concern of the workshop organizers was to figure out whether the type of questions asked in the application would be an asset, and if the participants felt that these would be relevant. Although the results of the questionnaire WAY CyberParks application have not been available in the Web application service, the participants/users had the opportunity to use this feature. Although they have not been able to answer all the questions, the result obtained in this question was quite enlightening, with no negative responses and the percentage of 92.3% positive responses.

In this question, together with the option of 'yes / no', the reasons for the selected option were asked. For the positive answer that was given, we could outline some of the justifications:
- It is a way of knowing what people consider to be an asset to the park;
- Used to understand the user's profile, which is useful for adjusting park needs;
- Allows to get more direct opinions of users;
- Yes, although I think that some of the questions could arise regardless of the visited area;
- Help to know the park and through the application can help/suggest new uses for certain zones thereof;

- Stimulate greater observation of space;
- Awaken the interest of the public space

Question 3: Do you think that there should have been some other questions?

To the question whether other questions should have been placed, half of the participants answered negatively, considering appropriate the amount of questions. About 25% of participants consider that there should have been other questions, the same percentage of those who chose not to respond.
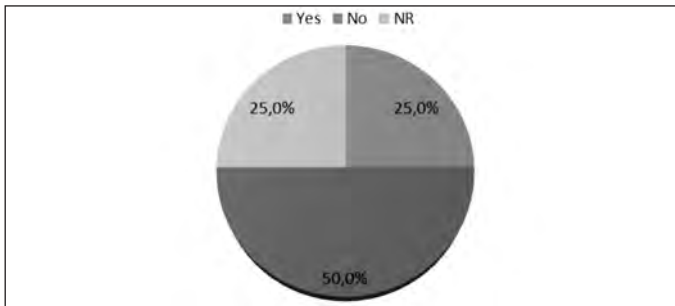
Graphic 2: Do you think that should have been some other questions?

In the questionnaire, participants were given the opportunity to indicate what questions should have been made. Although not all participants who have opted for this answer have indicated a new question, some of the ones that have been proposed are presented below:
- Questions should have different solutions and desires of the user;
- Reasons why the people go to the park;
- Place where they came from.

The contribution of possible questions to ask enables two types of analyses. In the specific case of the first contribution, the participant reinforces the need for the questions to be more specific, such as what they consider would look best in a particular area of the Park, with specific solutions. While some of the questions asked were in this sense, this type of observation may be an indication that there could be more questions about transformation solutions of certain areas of the Park. On the one hand, the last two questions posed were inserted into the survey application. This contribution may be linked to the fact that users have not had access to all issues, as explained above. On the other hand, the need to make some questions visible should be rethought, and whether that could be an asset to our analysis.

Question 4: Do you have any suggestions to improve WAY CyberParks application?

One of the main function of the distribution of this questionnaire was to obtain suggestions to improve the app, so the kind of questions mostly went in that direction. Most participants responded affirmatively, about 30% of respondents consider that the application does not need improvements, and 7.7% did not answer.
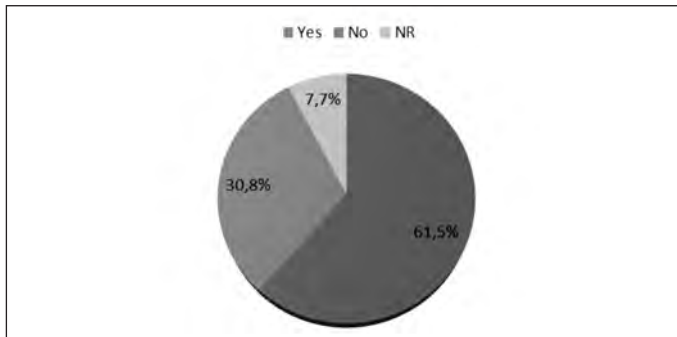
Graphic 3: Do you have any suggestions to improve WAY CyberParks application?

Some of the suggestions made by users include:
- Sounds for notifications of questions and other alert situations;
- Notifications with vibration;
- Application in Portuguese;
- Vibration and sound with the application minimized;
- System that rewards users to offset the battery spending;
- Improve interface;
- Automatic sending information when the application is used in offline mode;
- Improve the placement of photographs in the suggestion box, due to blocking problems in offline mode.

Suggestions of various kinds were obtained. On the one hand, there were a few that are not amenable to improvement, as is the case of sending information automatically in offline mode, as this mode only works with the phone's GPS, there were others that should be taken into account in maintaining the application, with particular focus on questions of notification issues, particularly in the modes of vibration and beeping when they enter the range of action of a question.

Other suggestions address the possibility of the application to be in Portuguese, a situation which seems unlikely. Still, it is indicative of the need for this to be in Portuguese, and which should be taken into account in future situations, particularly with regard to the conditioning of the results. Finally, one must mention the suggestions that consist in rewarding the users for using the application, in the specific case to compensate for battery depletion. In the specific case of this workshop, the results were presented at the Researchers Night, having immediately a "reward" by making the results available to participants.

Question 5: How long did you remain in the park? (Minutes)

Question 5.1: Is this time more or less what you usually spend in the Park?
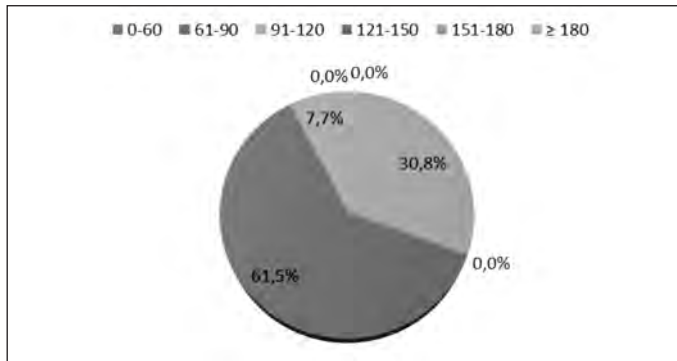
Graphic 4: How long did you remain in the park? (Minutes)
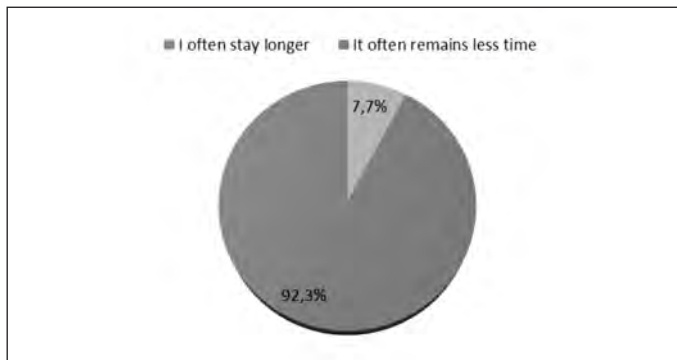
Graphic 5: Is this time more or less what you usually spend in the Park?

In addition to the issues directly related to the application, the questionnaire also had some framework questions such as the length of stay, presented here. Because it is a workshop with a predefined duration, the results were mostly similar (121-150 minutes) and there are small derivations of a shorter duration (91-120 minutes) in the case of participants who had to leave early and longer duration of participants who remained in place for an extended period (over 180 minutes).

The placement of the issue 5.1 intended to realize if the time that one usually stays in the park was higher or lower than indicated in question 5. The answers were almost entirely that in a normal situation the participants remain periods of time lower in the park, could be concluded that this group only stayed longer because of the Workshop.

Question 6: The use of the WAY CyberParks application allowed discovering something new in the Park?

To the question if the WAY CyberParks application was responsible for the discovery of something new at the park, 53.8% of users responded affirmatively. It was requested to indicate what was discovered, which includes the following:
    · Using the application made me know better the park;
    · The application puts us more attentive and observant of what surrounds us;

- Despite not having discovered new things, I rediscovered many of them;
- Quinta dos Lilases and Park amphitheatre;
- A lake, the ducks, the forest, the airport nearby.

The participants, through the use of the application, in some cases found new areas, such as the Quinta dos Lilases and improved their perception of the entire park and its surroundings. On the other hand, it was also noted that, by using the application, critical sense and observation about the positives and negatives of the park were stimulated, a situation that is easy to understand because it is a workshop that started with the description of application and its goals.

Question 7: Other comments and suggestions

The last question of the questionnaire provided to participants, was the placement of other comments and suggestions they consider relevant regarding the WAY CyberParks application. We present below some of the comments and suggestions that were made:
- Better dissemination to the population. Publicity in the Parks with internet point for downloading the app;
- Where answers were given an icon should appear to prevent others to give the same suggestion. The report could arise when selecting the icon, and people could "like" or "dislike" either agree or disagree with the criticism;
- Thanks for the opportunity! I think it is a very interesting application to take advantage more and "discover" the parks.

Although it has been a little option used by the participants (only 20% used this possibility), the observations allow assessing the need for users in the application to target a wider spread among the population. Basically, fulfilling what was intended with the realization of this Workshop and the presence in the Researchers' Night. The suggestion of giving "likes" and "dislikes" to other users' proposals, at least at this stage of investigation, does not seem feasible, although the same should be considered in the future.

V. CONCLUSIONS

The use of ICT allows a new approach in the planning of public open spaces, in order to create more attractive and inclusive spaces in our cities. Throughout history, the public spaces were being responsible for the identity of our cities, having different functions from the social point of view. Currently, users of these spaces have new needs, and planners have the responsibility to adapt to these needs.

The great challenge, through the use of ICT, is to promote interaction between users and decision makers, to improve public spaces, adapting them to the needs of its users, and above all promoting the existence of new users. By improving public open spaces, we are encouraging healthier living habits, contributing to improving the living conditions of the population.

The use of the application WAY CyberParks, according to its characteristics, has the means to make a significant contribution to the study of public open spaces. The type of results produced allow to quickly and efficiently collect a set of data that may be essential for improvement in existing spaces, and as support for new spaces. The workshop results analysed here allowed us to verify that. Although it was not possible to obtained all the data, including the questions placed in application, other information were essential to be able to draw some conclusions about the improvements that can be made in this application. The next steps to be taken include increasing the use of the application in several case studies, including those mentioned in this paper. These case studies will strengthen the assessment of the relevance of digital media in the study of the relationship between public space and its users.

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