

Recitoire: a tool for qualitative surveys involving citizens in urban planning projects

David Noël
Steamer Research Team
Grenoble Computer Science Lab
681 rue de la Passerelle, 38400 Saint-
Martin d'Hères, France
david.noel@imag.fr

Marlène Villanova-Oliver
Steamer Research Team
Grenoble Computer Science Lab
681 rue de la Passerelle, 38400 Saint-
Martin d'Hères, France
marlene.villanova-oliver@imag.fr

Jérôme Gensel
Steamer Research Team
Grenoble Computer Science Lab
681 rue de la Passerelle, 38400 Saint-
Martin d'Hères, France
jerome.gensel@imag.fr

Abstract

The difficulty to involve citizens into projects that influence or transform their experience of the urban space is underlined by public authorities and professionals such as urban planners. The implication of citizens in the existing modes of consultation (public meeting, opinions polls) is often limited and not representative. New solutions for facilitating citizens' involvement in both the diagnosis and the construction of the city need to be found. We propose here a prototype called Recitoire, as a support for qualitative surveys involving citizens in urban planning projects. Using a mobile application, a data collect is performed which includes the path followed by a citizen (her/his trace is kept) and the different kinds of media files she/he produces all along the path to illustrate her/his feelings and impressions on a given thematic - chosen for the survey by urban planners. A server application centralizes the collected data and offers an interface for both their exploration and their exploitation by the actors of the urban project.

Keywords : crowdsourcing, city, project, citizen as sensors, participation, mobile.

Context

Amplified by the advent of Google Maps in 2005, an interactive cyber-mapping has developed strongly in which contributors describe themselves the space where they live, giving a contemporary form to geography, called neogeography [2]. This new behaviour questions directly public authorities, professionals working for the town and country planning, and scientific communities about the evolution of tools and the role of the different actors involved in this field.

In particular, the evolution and practices of new technologies linked with spatial data lead to new applications, which might deeply change the way to think urban and territorial project [1, 2]. These new solutions include giving the voice to the urban space users – also users of the local amenities offered on the territory –, considering “citizens as sensors” according to the expression of Goodchild [2].

In France, consultation practices applied and followed by project managers respect the rules defined in the law related to solidarity and urban reshaping (December 2000) and by the Town Planning Code (for example public consultations and meetings). However, research in territorial sciences has suggested going beyond such practices and has shown the importance of an effective and continuous communication between all the actors who could feel concerned by the design, development and management of urban and territorial projects. Researchers also confirmed the hypothesis that data collected by citizens improve the information used in the decision making process in the domain of spatial planning [3]. Furthermore, the integration of Volunteered Geographic Information into urban management program is identified in recent work [4] as a research challenge, especially for the definition of useful types of contribution in urban management.

In this context, our research group called FabTer¹ (“Fablab Territoires”) has initiated some work around new methodologies and associated software solutions to encourage citizens' implication in the process of making a diagnosis about the territory and addressing urban planning issues. We have designed, prototyped and tested a client/server application called Recitoire that aims at collecting qualitative data from citizens and at visualizing and analysing them through a specific interface for urban planners. The name Recitoire comes from the contraction of the French words *Récit* (narrative) and *Territoire* (territory), and refers to the narrative setting of the territory that is expected from the users. Using a mobile application, a data collect is performed which takes the form of both a path followed by the citizen (the track is kept) and the media files she/he produces all along the path to illustrate her/his feelings and impressions on a given thematic. A server application centralizes the collected data and offers an interface for both their exploration and exploitation. Recitoire therefore serves as a support for conducting surveys with the citizens concerned by a given urban project.

In this paper, we first present our motivations in designing the application Recitoire. Then, we explain how a survey is managed with the help of both the mobile and server side of the application. A review of related works is presented. We give some elements regarding the first tests we have conducted before we conclude and discuss further works.

2 Motivations

Citizens are expected to participate actively and from its very early stage to any urban planning project that is supposed to transform their city. We claim that “citizens as sensors”

¹ The collaborative research project FabTer is made up of researchers of Pacte (UMR 5194) et LIG (UMR 5217, Steamer group) labs and of the consulting firm DêTOUR (all in Grenoble, France).

approaches, and associated tools, do have some assets to fulfil this twofold requirement - *actively and from its early stage*. Through Recitoire, we propose a Smartphone application that allows users to contribute in an easy and attractive way to give their opinion about their everyday space (where they live there, where they work, etc.). They can express their own feelings about this space, as it is or as they would like it to become, and document their contributions with various media (video, photo, audio, text).

The particularity of our approach is that the contributor is expected to report a consistent reasoning about her/his urban space instead of an inventory of unrelated observations. For that purpose, we ask the citizen-contributor to tell a story she/he illustrates with images, sounds and texts. We call this story an *urban narrative*. It means that all the contributions should not be completely independent from each other and that it is possible to find the meaning of this urban narrative. The application Recitoire Mobile has been therefore developed to facilitate the emergence of a story, offering thus some support to qualitative surveys about citizens' territory. A citizen can use this mobile application on a path that she/he follows every day (for example to reach her/his workplace) or fixed for the study, having in mind to tell a story on a specific thematic.

The application we propose has been designed and developed to allow urban planners to easily configure a survey according to their needs as presented in the next section.

3 A survey supported by Recitoire

3.1 Overview

Let us suppose that the manager of a urban project wants to conduct a survey with the residents of the impacted sector. Together with urban planners, she/he designs and plans the study as a classical one (when, with who, on which topic, etc.), but having in mind that citizens will use the application Recitoire Mobile for collecting the data related to urban narratives. The mobile application can be configured accordingly using specific functionalities provided by the application Recitoire Server. The data collect is made by and thanks to citizens equipped with Recitoire Mobile on their devices. Data are then centralised through Recitoire Server and available for an analysis by spatial planning expert or project manager.

3.2 Configuration of the Recitoire Mobile Application

The qualitative survey to carry out is characterized by a given theme on which citizens will have to contribute. "Your route to workplace on foot" or "Places for a break during a walk with children in your area" are examples of such themes. A theme is the topic on which contributors will be invited to tell a story when they will start the application. The theme (a short sentence) can be associated with a picture for look and feel purpose. A set of keywords is also defined that will be used by citizens in order to tag their *contributions*. A contribution is composed of a media files (photo, video, etc.) localized (in space an time), associated with an optional comment and tagged, all being in relation with the theme of the study. Together, all the contributions made on a route form a urban narrative.

The project manager has then to decide at which (time or space) interval a contributor will be invited to contribute. For example, she/he can impose contributions each 20 meters if she/he want very frequent feedback (which could be adapted for the theme "Your route to workplace on foot") or give no constraint (free contributions are more adapted to the theme "Places for a break

during a walk with children in your area" or to the theme "Your route to workplace" if a means of transportation is used).

Finally, the project manager can choose information she/he needs to know about the contributors. This information will form the personal profile of the contributor.

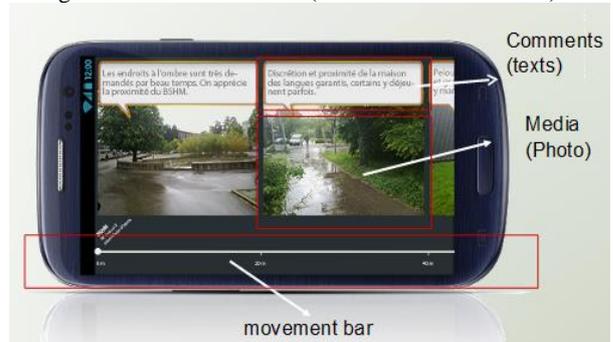
To perform this configuration, the project manager uses the application Recitoire Server (see section 3.4 and 3.5). A succession of forms allows her/him to enter the different parameters (related to theme, contribution interval and user profile). An XML file is generated at the end of the process. This file is then stored on each device and is used to configure the mobile application.

3.3 The Recitoire Mobile Application

Recitoire Mobile has two main functionalities: Create a urban narrative (that is, a data collect mode) and Visualize a urban narrative (that is, localize it on a map and access its contributions). The application main interface for data collection is shown in Figure 1.

A story-databoard is the receptacle of the citizen contributions. Inspired by the cinematographic concept of

Figure 1 : Recitoire Mobile (Create a urban narrative)



« storyboard », it shows the contributions and their associated comments appearing one after the other in the chronological order on the screen using horizontal scrolling. The idea is to provide a visualization of the whole urban narrative on the screen. To contribute, the citizen chooses the media she/he wants to create (photo, video, audio). After recording, she/he is invited to comment her/his contribution in an audio or textual way.

If the contributor is walking, a movement bar appears under the story-databoard indicating the distance and the different names of the locations she/he has passed by all along the route. For a contributor using a means of transportation, the movement bar can be disabled.

In both case, at the beginning of the route, she/he has to give names to her/his starting and arrival points and, at the end of the route, to confirm that she/he is arrived at the ending point. The contributor is also invited to describe her/his route, in order to make easier the future exploitation of her/his story. She/he must therefore comment it, giving it a title and choosing keywords in the predefined keywords list.

The user can visualize the route on a map and she/he can play again the contributions she/he has made (see Figure 2).

Figure 2 : Recitoire Mobile (Visualization of a Narrative)



3.4 The Recitoire Server Application

The Recitoire Server application has been introduced in section 3.2 where the configuration functionality is presented. This application is also dedicated to import and exploit all data collected using the Recitoire Mobile Application.

The citizens' narratives are downloaded from mobile devices and loaded into the Recitoire Server database. For the moment, data extraction requires connecting the mobile phone used to a computer for a direct transfer from Recitoire Mobile to Recitoire Server. This task is easily achievable thanks to a wizard.

Once uploaded, the data produced by the citizen are available in the server application interface for consultation and analysis (Figure 3).

The list of all created narratives within the context of the current study is proposed. It is possible to filter urban experiences according to many criteria: temporal (date, time, journey duration), spatial (particular area of the investigated sectors, distance travelled), thematic (keywords), media type (photo, video, audio, text) and contributor features (components of her/his profile) (see left side on Figure 3).

For each urban narrative, the simultaneous visualisation of the route and of the story built all along is proposed. The story appears according to the story-databoard model (with contributions and comments). The contributions are also located on the map and made visible by clicking on the corresponding point.

The project manager or urban planners can use this interface to

explore and analyse the routes and contributions in order to build some report summarizing the contributors urban experience feedback in line with the theme that have been defined for the survey.

3.5 Technical aspects

To date, Recitoire Mobile is designed for Android System only. SQLite is used to store data and the OSMDroid API to display OpenStreetMap Maps.

The server application is developed in PHP, JQuery, HTML5 and CSS3. It also uses the bootstrap CSS framework. Data are stored through SQLite and the OpenLayers API is used to display OpenStreetMap Maps.

Apart from the interfaces and functionalities presented in this paper, Recitoire Server provides users with two wizards. The first one concerns the definition of the survey parameters and the generation of appropriate configuration files for the device mobiles to be used by citizens. The second wizard helps to upload the collected data from the mobile devices to the server application. These functionalities allow the actors of urban projects to be autonomous when using Recitoire.

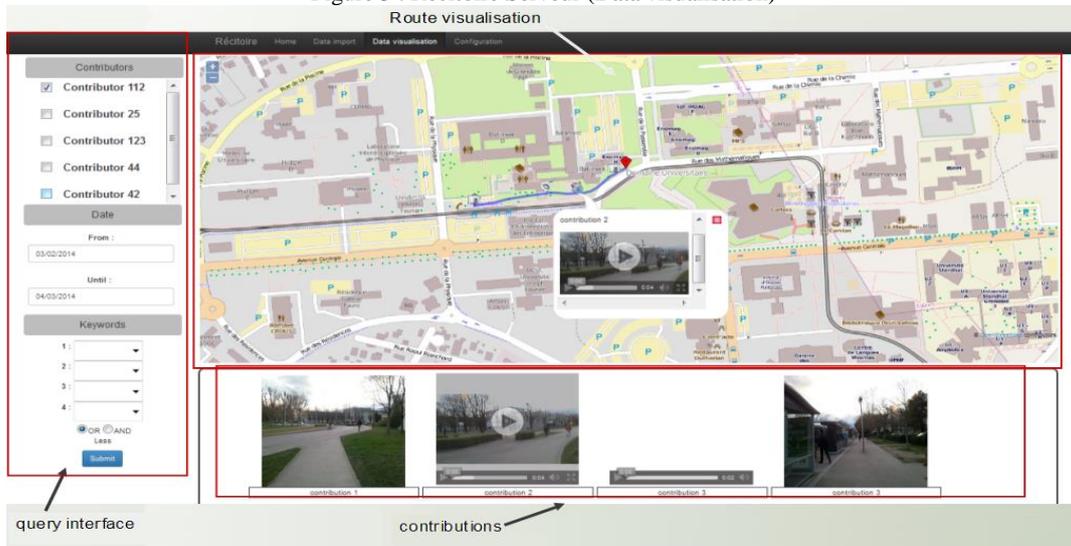
5 Related works

There are many applications or frameworks dedicated to the creation of VGI applications. Mocomapps [5] and Sensr [6] allowed non-programmers to create their own VGI applications. These applications rely on the principle of re-using predefined interface elements. This principle allows non-programmers to create their own applications but it does not fit with the creation of a more complex application like Recitoire.

More closely related to our work, wq [7] is a modular framework for VGI applications. It enables programmers to reuse modular components in order to facilitate the creation of VGI applications. However, in our case, the underlying model we use (a set of multimedia contributions localized possibly at regular interval temporally organised) imposes a very precise data structure that does not fit with the available frameworks.

Many applications are comparable to Recitoire as they allow for a citizen data collection from mobile devices including media contributions. PhotoMap² [8] is an application that we

Figure 3 : Recitoire Serveur (Data visualisation)



<http://photo.mping.com/fr/RECITOIRE/>

have developed and that has inspired our work on Recitoire, especially the combination between the route and geolocated photos along it.

The application Beecitiz³, used by several French municipalities, or FixMyStreet⁴, are based on the principle of FixMyCity⁵: in a specific town, citizens report local problems (degradation, erased marking...) in order to help services of the municipality. This clearly aims at inventorying isolated and negative events but not at constructing a tale providing a global feeling about the surrounding urban space. This application can help one municipality to fix day-to-day problems while the Recitoire application addresses more issues related to the co-construction of the city together with citizens.

The application Mappiness⁶ collects data from citizens about their feeling in terms of well-being level but not their feedback about their own urban experiences.

The application MyFunCity⁷ can be compared with Recitoire because it also aims at impacting public policy but not in a particular project and from its beginning (diagnosis phase). Indeed, the initiative to use MyFunCity is not configured and launched by an urban project manager: the citizens are simply invited to express themselves about a whole city.

The idea of multimedia citizen contributions is also present in the implementation of contribution platforms based on the LOCAST⁸ framework, for example in the project Rio South Mapping⁹. Comparatively, Recitoire is a tool designed for the particular needs of urban planners and whose set up does not require particular computer skills.

6 First tests

We have conducted some user tests with twenty students of the Urbanism Institute of Grenoble (Urban Design Master degree) and twenty citizens encountered during the Experimenta¹⁰ Exhibition. They have been asked to use Recitoire Mobile on a case study, and then to fulfil a questionnaire built in order to assess:

- The degree of satisfaction of users with regard to the principle of the contribution that is expected from them: the construction of an illustrated tale on a thematic imposed.
- Their feelings about the functionalities offered by Recitoire Mobile and their usability.

The principle of telling a story instead of creating independent contributions is considered useful or essential by 70% of the users. Conversely 25% considered it unnecessary. Furthermore, the opportunity to review these stories on the phone is useful or essential for 90% of the users.

We can also notice that the diversity of the media available in order to contribute is widely considered as essential (90%).

The functionalities are reported appropriate and useful for 35% of the users but incomplete by 35% and inadequate by 5%. Some of the users suggested a cartographic visualisation of the area during the route. The use of these functionalities is considered as simple or fairly simple by 75% of the users. However, though 75% of users consider as clear the explanations they were given before they use the application, 35% also suggest a self-training session including examples of what is expected.

7 Conclusion and future work

In this paper, we have presented Recitoire, a client server application that aims at facilitating the implication of citizens in the very first step of the lifecycle of an urban project. Qualitative surveys can be organised using the mobile application. A data collect can be performed involving citizens who are asked to build a narrative about a thematic following a path and illustrating it with the help of media files. A server application centralizes the collected data and allows the actors of the urban project to explore and exploit the feedback of citizens through a specific interface.

Our first tests with the prototype show that citizens welcome such an approach. The application has been set up together with specialists of urban planning but we intend to make other tests with policy makers for instance.

As future work, we address two issues. First, we need to make the approach evolve so that studies at a larger scale (in terms of territory but also of number of respondents) can be led. This requires for instance to develop functionalities for the online upload of data collected by citizens from their personal devices. Second, we intend to propose more advanced functionalities at the Recitoire server side for the processing and the analysis of the data collected. This is particularly important if one considers that the volume of collected data increases.

References

- [1] Elwood S. *Geographic Information Science: new geovisualization technologies – emerging questions and linkages with GIScience research*. Progress in Human Geography 33 (2): 256- 263., 2009
- [2] Goodchild M. F., 2009, *NeoGeography and the nature of geographic expertise*. Journal of LocationBased Service 3(2) : 82- 96
- [3] C. Seeger C. (2008). *The role of facilitated volunteered geographic information in the landscape planning and site design process*. GeoJournal, 72 (3) : 199-213.
- [4] Song W. and Sun G. *The role of mobile volunteered geographic information in urban management*. In 18th International Conference on *Geoinformatics*, pages 1-5, June 2010.
- [5] Hupfer S., Muller M., Levy S., Gruen D., Sempere A., Ross S., and Priedhorsky R.. *MoCoMapps: mobile collaborative map-based applications*. In ACM CSCW Companion '12, page 43-44. ACM, 2012.
- [6] Kim S. and Paulos E.. *A subscription-based authoring tool for mobile citizen science campaigns*. In ACM CHI Extended Abstracts '12, page 2135-2140. ACM, 2012.
- [7] Sheppard, S. A. (2012). *wq: A Modular Framework for Collecting, Storing, and Utilizing Experiential VGI*. ACM SIGSPATIAL GEOCROWD'12 Nov. 6, 2012.
- [8] W. Viana, J. Bringel, J. Gensel, M. Villanova-Oliver, H. Martin. *PhotoMap: From Location and Time to Context-Aware Photo Annotations*. J. of Location Based Services, vol 2, pp 211-235, 2008.

³ <http://www.beecitiz.com/>

⁴ <http://www.fixmystreet.com>

⁵ <http://fixmycityapp.com/>

⁶ <http://www.mappiness.org.uk/>

⁷ <http://myfuncity.uol.com.br/>

⁸ <http://locast.mit.edu/>

⁹ <http://www.beecitiz.com/>

¹⁰ <http://www.experimenta.fr/>

