

New maps from the media-city: CityMurmur as a tool for the visualization of urban space

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Résumé:

Abstract: The aim of the paper is to present the first results of the CityMurmur project and to discuss the potential of the tool in the description of the new shape of the media-city. CityMurmur aims to show how different media differently describe the urban space through a set of maps resulting from the intersection of news sources and the geographical reality of the city. In this context, cartography is taken into consideration not as passive representation of reality but as a tool for interpretation and action on the urban space. In the first part of the paper the concept and objectives behind the project are explained, the second part aims at providing a description of the CityMurmur Project, in the final part some preliminary results and case studies are discussed.

1 The shape of the media-city

To depict an urban space means to present it through visual systems able to capture its identity, representing it back in form of images. Blazons and coats of arms, banners and flags, logos and corporate identities, posters and postcards are examples of old and new narratives for the territory. Through different codes they tell the various elements that in the centuries have given identity to the territory: possessions and alliances, territorial characters, industrial productions, spaces and architectures.

Recently, however, the panorama of the city changed dramatically. The contemporary critical urbanism movement has proposed new models to describe the city: an extended model that replaces the concept of structure with the vision of a soft-city in which architecture and city planning are no more the basis for the city's

identity. The space of the city that historically, albeit in different ways, has always been the origin of the city's shape¹, in the today's city loses its importance, and takes on temporary, incomplete and hypothetical shapes, with dynamics closer to those of the biology of living beings than to the categories of urban planning.

The model used so far for the description of the historical city is not extendable to the dynamics of the postmodern city: there is a qualitative discontinuity in the transition between the yesterday's city and the metropolis of today that prevents us from using the same interpretation model. Architecture and urban planning are no longer able to describe the urban space, which is no longer fits in the traditional parameters of those disciplines. The structural approach to the city discourse gives way to an approach in which the interpretation of data is abandoned in favour of the experience of reality as a text (a hermeneutics) followed by a subsequent narration. The strong identity of the historical city, based on highly characterized elements (buildings, workshops, and quarters) is therefore replaced by a network of weak identities that are multiple, fragmented, temporary, and sometimes even in conflict with each other.

Beside the evident city and the historic city, a number of hidden cities emerge: a city as seen by local media, full of places and events distributed over the territory; a city of international media, in which the crucial point of political and cultural activities is reduced; the cultural city and the sports one. Each of these cities interacts with others, and leaves traces of its presence: weak signals and insignificant noises when taken individually become important signs once collected and reported. Once the space of meaning (and the meaning of space) is lost, the identity of the city becomes more and more entangled in stories and narrations stemming from human-place interactions: not only in a physical perspective but also in a virtual, cultural and media-related one.

This stratification of narrations demands new modes of inquiry and synthesis to depict the new qualities that constitute the present core for the identity of city-systems. The traditional forms of mapping and representation of the city that focus mainly on the physical structure of the city, are made inadequate by the new forces that are shaping the city and by the possibility, and sometimes the necessity, to consider the urban reality as an organism or a complex system. To meet these new needs a new generation of city maps has to be conceived: coextensive visions capable of defining and visualizing both the physical and social, the individual as well as the collective narratives.

2 The CityMurmur Project

The CityMurmur² project, presented in this paper, constitutes an early experiment in addressing the need of a new narrative for the media city. A representation aimed at displaying not so much the geometrical characters of the city, as its new, media-determined shape.

The aspiration is to experiment new cartographies, built on news and rumours rather than on streets and buildings, suitable for the representation of the multiple identities that overlap in the media narrative. The objective is to expose the media discourse on the city, and to visualize the reciprocal influence between mediated messages and the social and physical reality of the city.

The topographical reality made up of streets, squares and points of interests, intersect with the semantic reality of news, rumours, and information coming from various sources, and the images that result from this interaction merge into the urban geography. These images create a media cartography, a new representation of the collective narration that aims to show the influence of media on the city, describing the information flows and linking them to a physical geography.

From a technological standpoint, CityMurmur is a web application that periodically scans a pool of news sources, blogs, and online newspapers searching for references to local streets, points of interest and areas of the city. Using this information the application is then able to plot topographical and semantic maps of the city according to the topic discussed by the news source (culture, society, ...), the source's typology (blogs, online newspapers...), and its scale (local media, regional media, ...).

¹ Space is a perspective form in the cities of Italian Renaissance, it is the celebratory space of bourgeois housing that mimics the relics of a fallen aristocracy in Hausmann's Paris [1], it is a symbolic background and an image of the domain of the public over the private in the Nazi city [2], it is a functional typology in the rationalist democracy [3].

² Currently being tested for the city of Madrid. < www.citymurmur.org >

2.1 The media pool

The core of the application is a collaboratively created news sources pool³ classified both through denotative and connotative categories. The pool includes all the sources appearing in the official Madrid local media list (provided by the institutions), with the addition of online editions of the most important newspapers, online free-press newspapers and personal blogs linked to the city. Beside this editorial sources selection operated by the authors of the project, CityMurmur.org provides a section of the website for user contributions to the news pool.

Every six hours each feed of the pool is downloaded and all the news of the feed are scanned in order to see if any street, square or specific point of relevance⁴ of the city is mentioned. All the news containing a geographical reference are categorized by type of the source (blogs, online newspapers...), the scale of the source (local, regional, national...) and the topic discussed by the source (culture, society, politics, sports, environment...). Beside this denotative categorization, a connotative description is obtained by extracting relevant keywords from the news through a basic text mining algorithm.

2.2 Mapping

Using the data and information collected by the application and matched to the city streets, two classes of visualizations are produced: a Topographic Map and a Semantic Map.

In the Topographic Map, new media cartographies are drawn using free GIS data from OpenStreetMap⁵ in order to show the geographical distribution of media attention on the city. The map is obtained modifying the thickness of each street and point of relevance of the city as a function of the amount of the news related to them. Each element is coloured according to the most frequent value of the category (chosen as colour criteria) found in its news collection.

The Semantic Maps represent the semantic proximity of places while completely ignore the city's geographic space. This visualization shows a network graph where the nodes are keywords coming from the news – related to the city – and the links are the places that physically connect those terms. The size of every keyword-node describes its impact on the city, while the thickness of the starting and end point of each link is related to the presence of the keyword in each place. The colour of the nodes indicates the most relevant value for those terms, according to the category chosen as colour criteria.



Figure 1. Example of topographic map

³ At the moment the Madrid CityMurmur media pool is made up of about 700 news feeds in RSS format.

⁴ In the Madrid version of the project, the news are matched against a database of around 7.000 features.

⁵ OpenStreetMap. < www.openstreetmap.org >

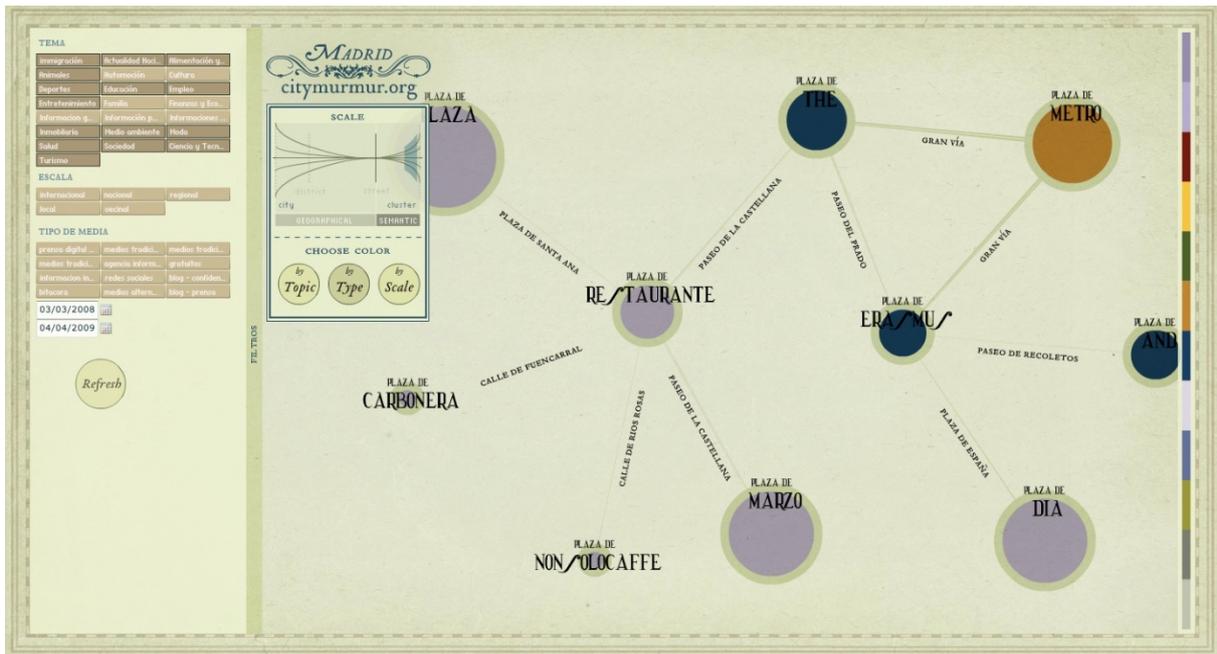


Figure 2. Example of semantic map

2.3 The user interface

Building on these two main representation models, the user is free to interact with the mapping application by freely filtering the contents to be show on the map. Working on the Filters Panel, the user can control which values will be included in the visualization. For each category (topic, type and scale) a list of all the present values in the news pool is provided: by switching on or off the value buttons it's possible to include or exclude them from the map. The panel offers also the possibility to set the time period within which consider the news.

The Navigator panel allows the user to change scale, to switching between the two visualizations modes, and to change the colour coding criteria. The Legend, on the right, explains the meaning of each colour for the currently selected colour category criteria, while simultaneously displaying the amount of news for each value of the category.

The Analytics Panel, on the right, gives contextual information on the selected street in terms of news categories. The data from the categories provided (topic, type and scale) are matched in three indented tree diagrams, in order to better understand the characteristics of the media involved in the place discussions. The words that appear most frequently on the news related to the selected city feature appear below the diagrams in a Tag Cloud.

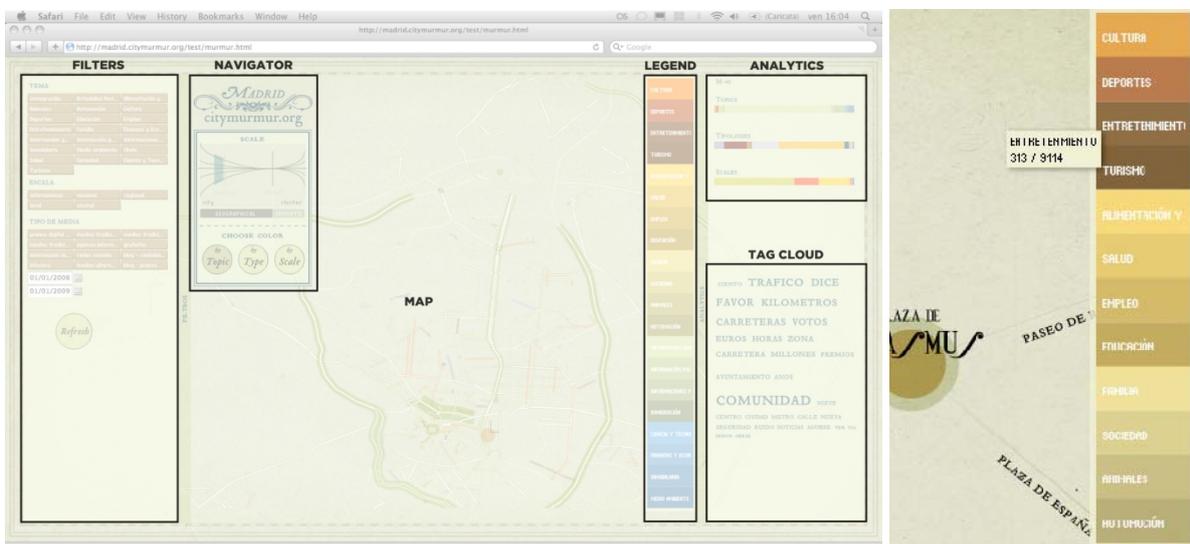


Figure 3. The components of the CityMurmur application

3 CityMurmur at work

The structured, but still quite flexible, approach used in the design of both the mapping application and the media panel, leaves a good degree of freedom to the user in the interaction with the application. By mixing selection operations, mapping projections and colour coding, the application allows to explore the media-city in many of its dimensions. Specifically, among other things, CityMurmur can display not only the distribution of attention that media pays to the city (which areas are the most talked-about), but also the evolution in time of this attention (how the between areas changes in time), the differences among type of media and dimension of media's audience, and the emerging themes of the discourse about the city.

In this chapter some examples of the system potentials are displayed and explained. Testing the system after some months of work allowed us to more deeply understand the potentiality of the results the system produces and to compare them with reality; each of the following examples will be associated with the news it referred to. Observing how some events are visualized and interpreted by the system facilitate in understanding the media-city and at the same time provide a key to observe the new Madrid the system depict.

3.1 Show the attention

3.1.1 Warehouse on fire

On the 23rd March 2009 the media reported the death of an indigent in Madrid in the fire of an abandoned industrial warehouse located at number 19 Calle Méndez Álvaro. If we look at the keywords it is possible to piece together the original information: firemen (bomberos) found a burned body (cuerpo calcinado) of a poor (indigente) in the fire (incendio) of a warehouse (nave).

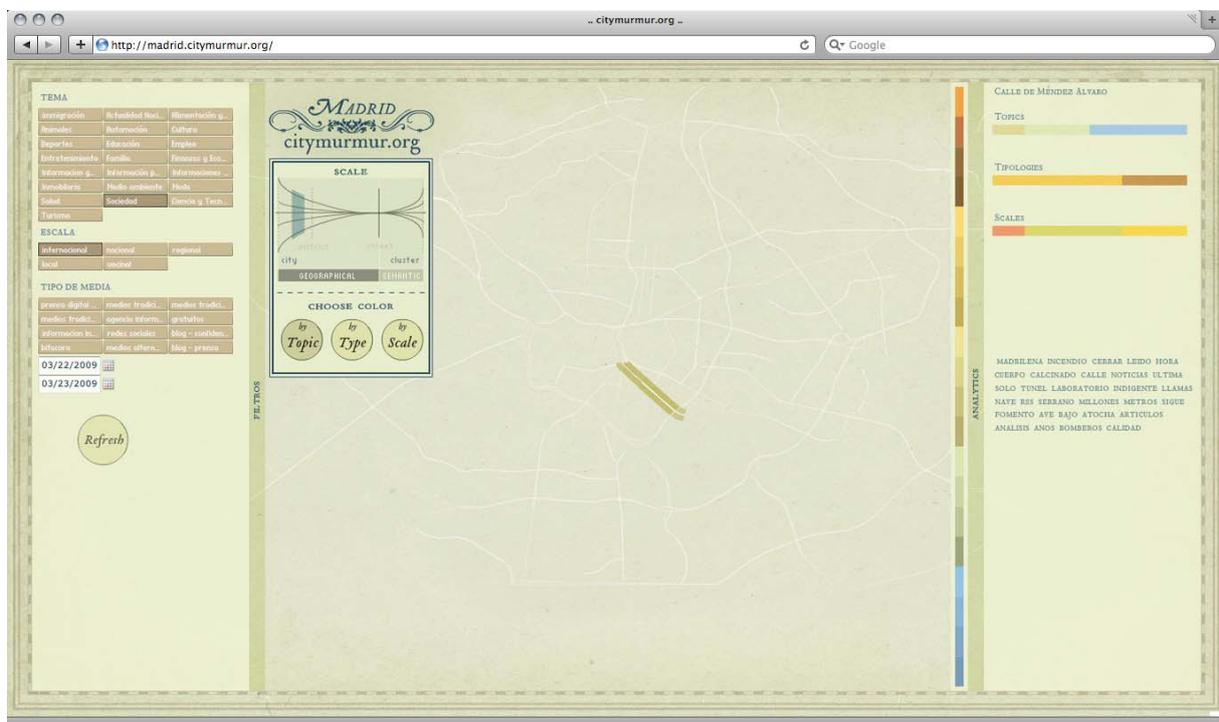


Figure 4. Map of International media on the 23rd March 2009.

Muere un indigente en el incendio de una nave abandonada en Méndez Álvaro

ABC | MADRID Publicado Lunes, 23-03-09 a las 06:06

A- A+

Figure 5. A related article, in the front page of the current events section of abc.es

3.1.2 The Real Madrid Assembly

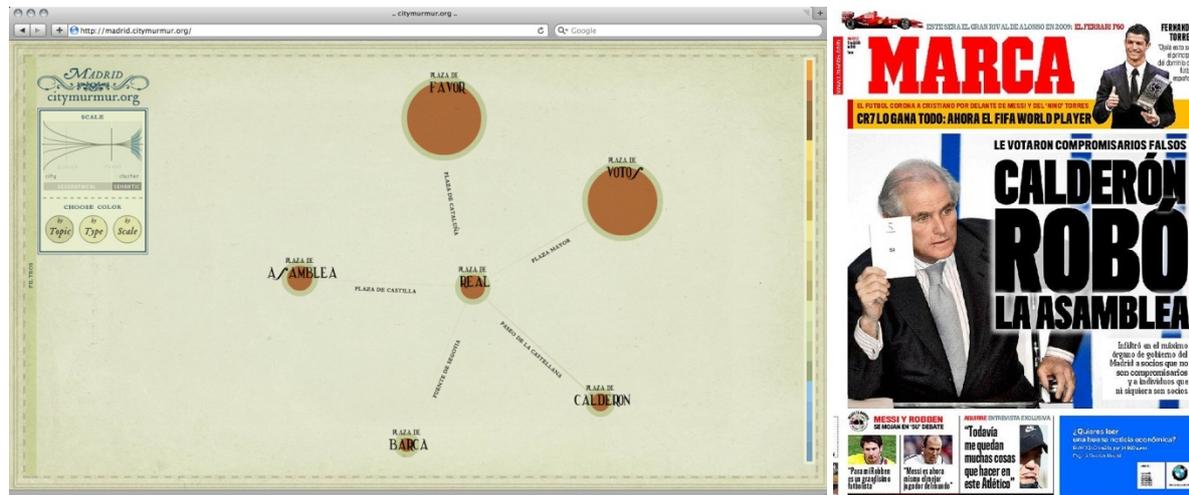


Figure 6. Semantic map of category Sport and front page of the news paper Marca

Ramon Calderon, Real Madrid's president, was protagonist of a scandal firstly published in Spanish newspaper Marca. Calderon stands accused of winning and securing the Presidency via a terribly naughty system of vote rigging. The paper claims the presidential team snuck through people who did not have the right to vote to approve the accounts.

Newspapers claim that this vote rigging was achieved with the help of fake "compromisarios" (club members possessing voting rights) whose membership had expired or who did not have enough tenure to legally fulfil the role but that were willing to make him a favour.

In the semantic maps selecting the category Sport – Deportes you can see the relation among the term Real (the name of the Football team, Real Madrid), the term Favor – favour (people make him a favour), the term Votos – Votes (it was a scandal in the system of vote), the term Calderón (the president name) and Asamblea – Assembly (the assembly it was called 'asamblea de socios') connected by the street which the news containing the two terms refer. In this example it can be seen the Castellana and the nearby Castilla where is the Bernabeu, the Real Madrid Stadium and where the assembly was organized. The Stadium, not present in the 'places' database, is unfortunately absent from the map.

3.2 Show evolution in time

3.2.1 Day of culture, day of politics, days of ecology

Navigating the CityMurmur system day by day it is possible to understand which news is related to the city in a specific day. The visualization allows understanding the main theme or topic in specific day that tells about the day life of the city. In the example we can see that on the 5th of December the main topic of all the RSS feed collected in the media panel was about politics (green); two days after, on the 7th of December the main topic was about culture (orange) with some touristic event (brown); on the 8th of December the media attention moved on the motorway M30 and was about some environmental issue.

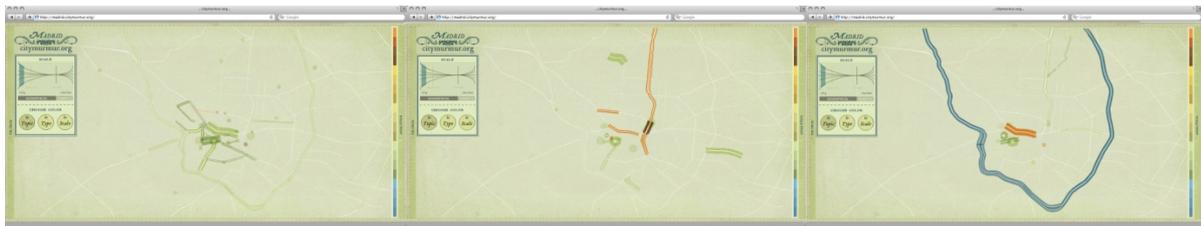


Figure 7. 5th, 7th and 8th December 2008

3.2.2 The Antifascist Manifestation

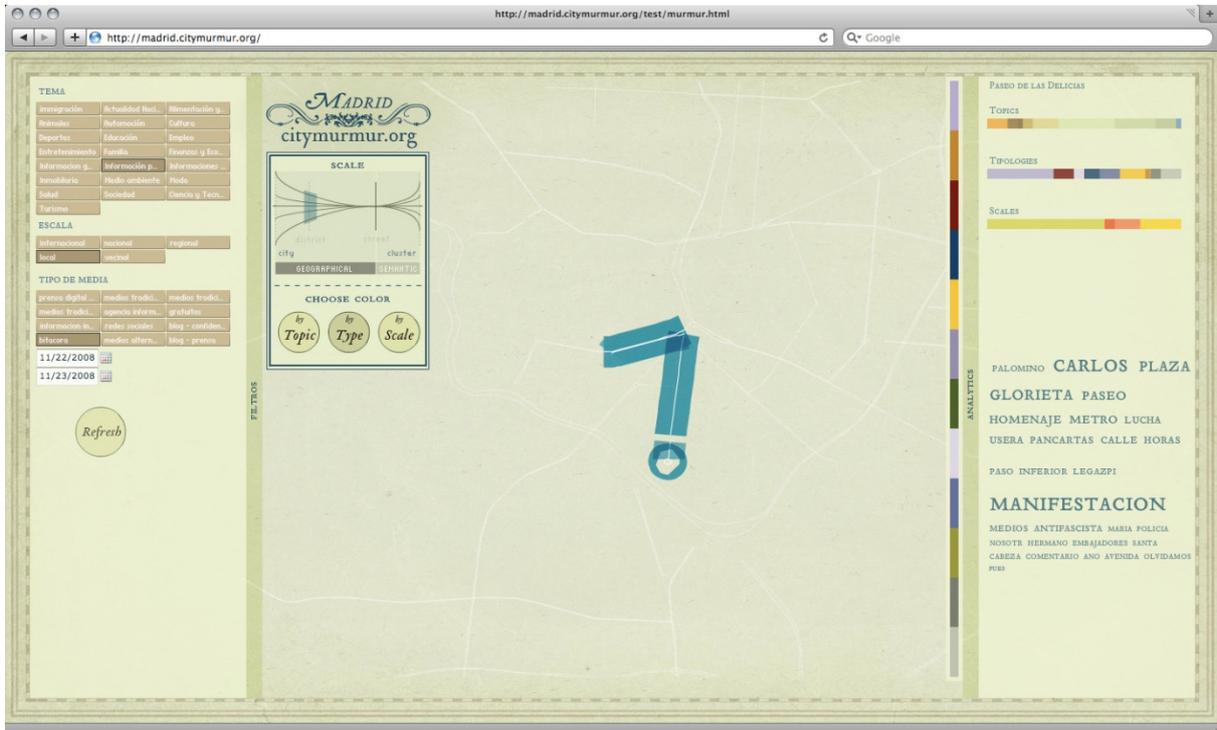


Figure 8. District level showing the route of the manifestation

On the November 22nd 2008 an Antifascist manifestation took place in Madrid. In the geographical map at the district level the CityMurmur system highlights the route of the manifestation: started from Paseo de Las Delicias and ended in Plaza De Legazpi (the blue circle). In the tag cloud, the keywords from the news allow to understand more in detail what media are telling about the event: *lucha* (fight), *pancartas* (written flags), *manifestation*, *antifascist*, *policia* (police)



Figure 9. A web site talking about the manifestation

3.3 Highlight differences

3.3.1 Discourse on the environment

Looking at the different results the CityMurmur system produces when filtering information with the scale of media, it is possible understand which parts of the city attract the media attention on a specific theme. For example, if we map information about natural environment and ecology by selecting the theme Medio Ambiente and we compare the maps the system generates we observe that international media talk about environment only with regards to a couple of street in the city centre and the Museo Nacional de Ciencias Naturales and the Biblioteca Nacional (the two blue circles); at a national level there is even less news about ecology, while the situation radically changes at a regional and local level: here the main focus is on the motorways as critical points for kilometres (Kilometros) of traffic jams (Trafico), pollutions and money investments (Euros, Millones) as the tag cloud clarifies. These maps could facilitate in doing abductions on the perception of environmental problems in different scales media: the smaller the scale is, the more the attention is on everyday problems as traffic jams and pollution, the bigger the scale of the information, the more it is on research and cultural issues.

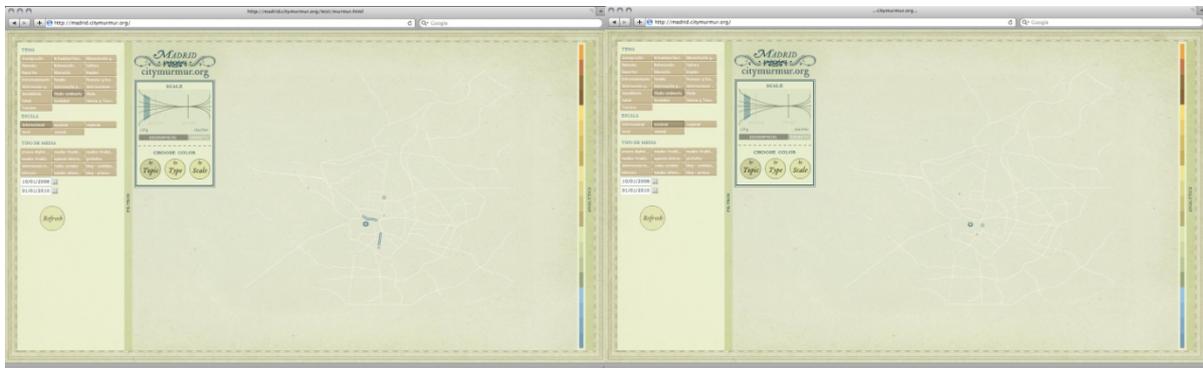


Figure 10. International scale (left) and national scale (right)

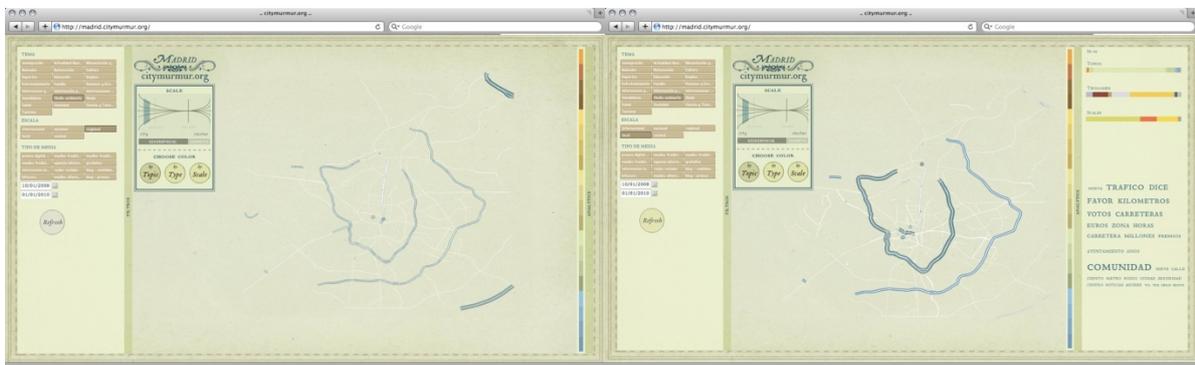


Figure 11. Regional scale (left) and local scale (right)

3.3.2 Snow in Spain

Selecting only free press in the semantic view the emerging map could make evident the prominence these media give to everyday events that affect the city life. In January 2009 a heavy snowfall (Plaza de nieve) covered Madrid: the government (Plaza de gobierno) closed (Plaza de cerrar) the A2 motorway and a lot of street (Plaza de Carreteras) were blocked, the news were suggesting to let the car home and use the public transport (Plaza de Metro) to get to the city centre.

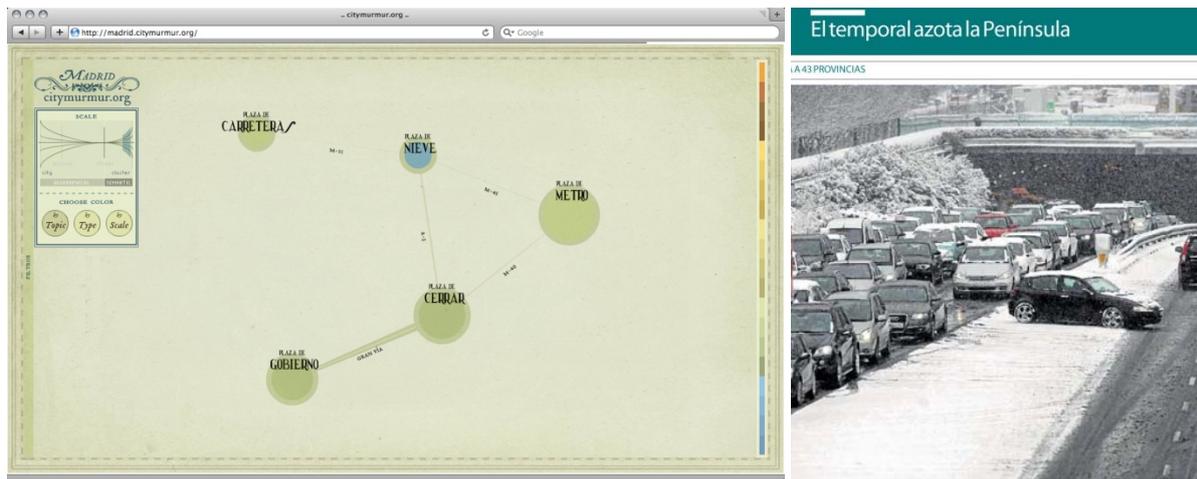


Figure 12. Semantic view and newspaper front page for a heavy snowfall.

3.4 Show emerging patterns

3.4.1 Money and blogs

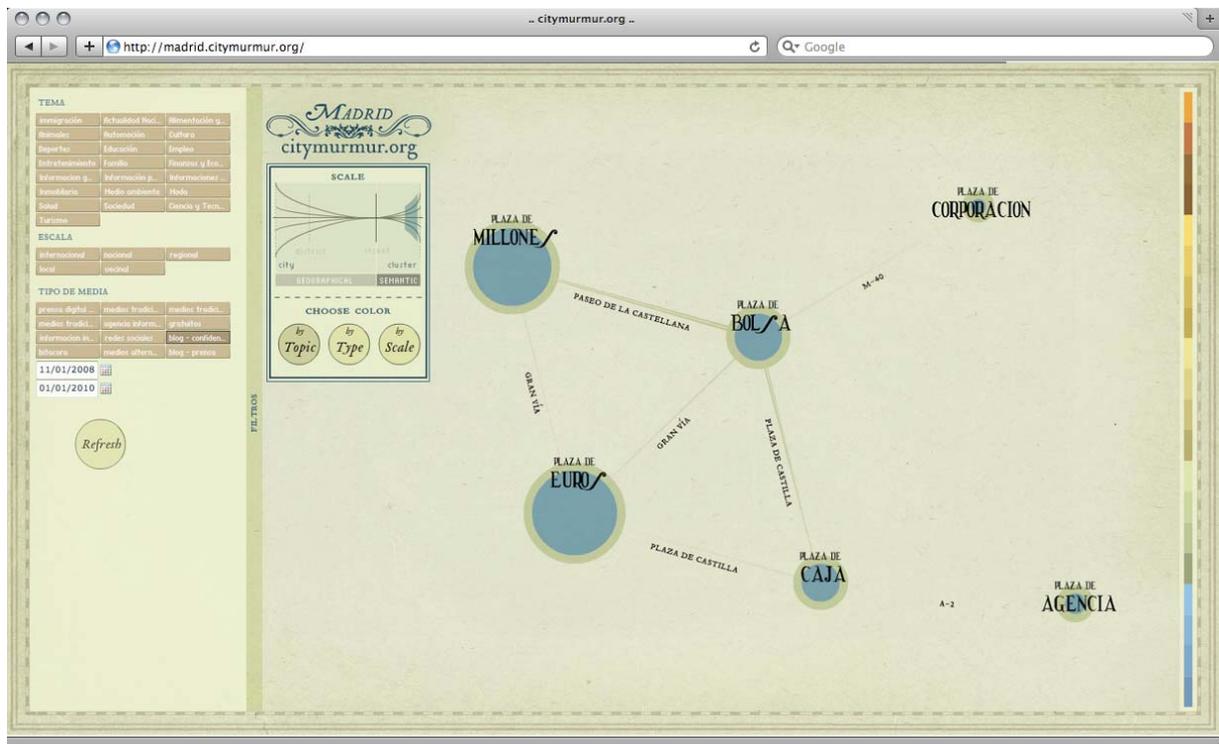


Figure 13. Semantic view of the blog keywords

Generating a semantic map of the entire theme filtered with the personal blog button (blog - bitacora) the emerging pattern results in a very high attention on economic issues. It can be noticed that in personal blog there is a discussion about Euros and millions related to the stock exchange (bolsa) and the banks (Caja) in the business centre of the city which can be probably correlated with the financial crisis issue.

4 New maps for the media-city

Beside the experienced city, an imagined and narrated city is growing. The ubiquity of medias on the one hand detaches the city identity from its own physical presence, making obsolete concepts such as ‘closeness’,

‘familiarity’, and therefore the ideas of ‘experienced’ and ‘historical’ places⁶, while on the other hand it constructs a new identity through an editorial selection of city places and events.

The shape of the media-city depends therefore on the media attention and on its audience. The selection of areas that are to be considered worthy of concern, and the type and connotations carried by the news that are associated with these areas decide the image of the city. The areas that are labeled as irrelevant do not appear in the story, in this image of the city, and therefore are also excluded from the collective consciousness of the public, the citizen, the tourist.

This task of construction of a new media-city, far from being simply a problem of perception or representation, influences, in turn, the physical and local space: as in Baudrillard’s third order simulacra [5], the discourse supposedly built on the physical reality actually precedes and determines the city in its local manifestation. The image of the city becomes a double-sided concept: on the one hand it represents tangible elements that are losing their meaning, on the other it creates a vision that determines the development of the city itself. In is a sort of locked-loop, areas described as disadvantaged are progressively abandoned, while areas described as safe by media become even more valuable, both commercially and socially.

For all the last century mapping has been considered as a quantitative and analytical tool, produced by experts for experts, undertaken as stable, accurate, objective and rational mirror of the space. The maps have been used more in relation to what they render rather than to what they could produce⁷. More recently, thanks to the theoretical background given by the representatives of critical cartography, a series of critical and unconventional mapping activities have been started mostly by non professional cartographers⁸. In a period that has been called the ‘Age of Cartography’ [13] in which “people with every kind of background continued to make every conceivable kind of map”, these mapping activities could be assumed as a model not only for the description of quantitative data, but also for the qualitative creation of a new narrative and discursive forms.

The new cartographic images produced by CityMurmur try to combine, rather than divide, the many stories, points of view that shape the geography of the city. It figures out a manifold, formed by the simultaneous presence and interaction of heterogeneous stories in the same optically-coherent space. Unlike tracing activities that describe what could be known and what already exists (i.e. the physical attribute of a space), the project tries to develop a mapping⁹ initiative, reformulating geo-referentiabile data, depicting digital shadows and footprints¹⁰ of human activities for better understanding the complex dynamic of a city. Accepting and extending the concept that some phenomena could emerge and reach a visibility only trough representation [16], CityMurmur tries to engage more with cultural project, to enrich experiences, rather than measuring urban spaces, to describe them. As Corner [17] claims that “mapping is particularly instrumental in the construing and constructing of lived space. In this active sense, the function of mapping is less to mirror reality than to engender the re-shaping of the worlds in which people live”, CityMurmur tries to find patterns and connections between media generated data and the geographical realm of the city.

A media-based city is a multidimensional, interrelated and fuzzy entity where instrumental and linear tools seem to fail¹¹. CityMurmur’s aim lays in an analytical and denotative depiction of the urban space (the geographical based map), but also in an inclusive and suggestive interpretation of the city narrative (though the semantic map) where disparate and heterogeneous fragments and multiple and interconnected layers are incorporated and reassembled as a synthetic image. The images and maps produced from the CityMurmur project re-territorialize a media stream of data produced outside and above the city, plotting and enlightening the latent relationship between urban realm and discursive production. The activity of plotting is not conceived as a mere list or an

⁶ By making everything accessible, the media transform the structure of space normalizing close and far away spaces, breaking the meaning of spatio-temporal localization. Cfr. [4].

⁷ For a summary on the influence of maps on the representatum see [6][7][8][9]

⁸ A series of others initiative could be found in Abrams and Hall [10]. Among the others could be cited the Bio Mapping project by Nold [11] that investigates the implications of creating technologies that can record, visualise and share the intimate body-state in relation to the surrounding environment. In such kind of project the demand for scientific neutrality is abandoned in favour of a constructivist fictional status of maps and J.B. Harley [12] argues that “if it is true that new fictions of factual representation are daily foisted upon us, then the case for introducing a social dimension into modern cartography is especially strong. Maps are too important to be left to cartographers alone.”

⁹ In Deleuze [14] the map, unlike the tracing, appear not so much as a mimetic artefact, but as a poetic and political tool. A tool that doesn’t copy the world, but creates new realities.

¹⁰ Defined by Girardin et al. [15] as the “record of an implicit interaction in the physical space with a digital means”.

¹¹ See also [18].

indiscriminate inventory: images generated by CityMurmur become enabling tools to depict and understand a collective and mediatic network, where the real and the image of the real and their difference became meaningless.

The new cartographic images become themselves a media that narrates the story of the city, replacing and hybridising the spatial data with the media-generated data, in which messages and communications deform the topography of the city. Derived from observations of the world, describing and displaying otherwise ephemeral data, maps are pure representations or mental constructs, ideas in form of images allowing and interacting with the change of what they depict.

Built on space, these new maps keep together, rather than divide, the physical and semantic components that make up the territory. In the best tradition of hermeneutics, having freed the cartographic representation from claims of neutrality and objectivity, the map becomes on the one hand the support for the exploration of this new territory, and on the other hand a tool to communicate the knowledge gained on the territory.

5 Discussion

While having a life of its own, the CityMurmur project also forms an integral part of a wider research conducted at the Politecnico di Milano and the Universidad de Malaga. Specifically, the theme concerned with the representation of knowledge and information addressed in the project has been previously dealt with, in particular in reference with the use of visualization in planning and decision-making processes [19][20], the adaptation of the cartographic methodologies to knowledge spaces [21], the use of communication tools in the context of integration processes [22].

From a critical perspective, even though the current development of modes and techniques to analyze and represent the digital life of the cities, as well as the life of their citizens, could lead to an improvement of how understand and plan cities, there is the need for a constant reality check. In reference to CityMumur, the strong bias present in both the media panel (made entirely and exclusively of online tools that provide a RSS feed), and in the map (made collaboratively by the openstreetmap community), provides a possibly skewed perspective of the media-scape of the city. Attention must be paid on how digital discourse analysis complements, and does not replaces, traditional methods and other means of data collection.

On top of this relevant bias, also the cartographic representation model, provides a perfect way to hide this partiality under a seemingly neutral and objective image¹². While the CityMurmur project tried to communicatively expose the authorial nature of the map through a playful and personal visual style, the potential for a misinterpretation of the map is still present.

6 Future work

With regard to further research, since the images out from the CityMurmur cartographic experiment only reveal phenomena but are not able to explain them, additional efforts should be devoted to develop skills and tools to make self-evident the meaning of the digital discourse and the significance of the images it produces. Answers to these types of issues should help to define the meaning of the new cartographies and better explore their potential usage in social sciences and urban studies. In a dense and diverse urban environment, daily generating volumes of information, the combination of interesting data, local based visual style to map the city through its narrative descriptions it seems that “mapping may thus retain its original entrepreneurial and exploratory character, actualizing within its virtual spaces new territories and prospects out of pervasive yet dormant conditions” [17].

The project presented in this paper has been developed at the Medialab Prado workshop Visualizar’08. During the 15 days of the workshop the potentials of such a project have been proved. Nonetheless, the work is scheduled to be extended in several directions, by adding a search tool to draw a thematic map based on a specific keyword, by developing a fully integrated timeline to observe the evolution of the news system, and most of all by testing it on other cities taking advantage of the system flexibility.

¹² For reference, see [23].

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