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Sharing views on spatial plans: scales of geographical information and public participation in social media

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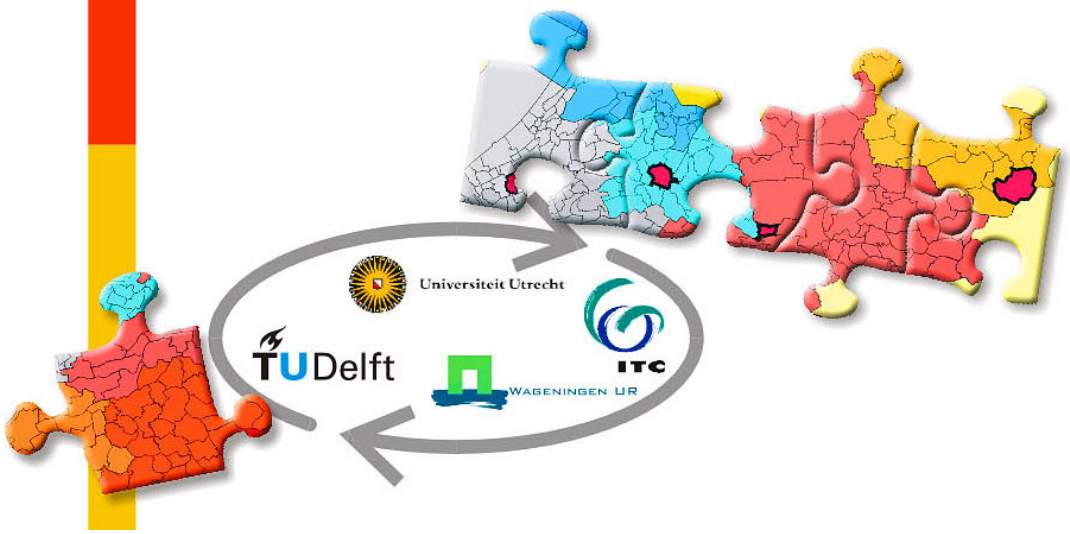

Sharing views on spatial plans: scales of geographical information and public participation in social media

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Preface

Being educated as an urban designer in a past life, I still tend to make sketches of proposals for spatial developments at various interesting locations. Just as a little hobby of mine. One day I decided to use Google Earth for this, drawing some lines and polygons representing a possible future Rotterdam-Spangen station area. Then I thought, wouldn't it be great to create a platform on the Internet where spatial plans can be presented in such a way, and also discussed?

As I was thinking of a subject for my thesis at the same time, and planning to talk with my internship supervisor Arend Ligtenberg about some subjects at Wageningen University, I decided to present this idea of designing such an application. Arend fortunately was quite interested, and called in Ron van Lammeren to assist.

After a few reviews and revisions of the thesis proposal, we decided the research needed to be narrowed down drastically. So instead of trying to create something new, as others have been doing, I started to investigate what's already there. How are people discussing spatial plans using social media at the moment? And this proved to be very interesting research material.

I'd like to thank Arend and Ron for all of their feedback and hospitability at the Gaia building and various other convenient locations. I'd like to thank professor Arnold Bregt for backing my research. And also Peter Commissaris from the municipality of Alphen aan den Rijn for his cooperation and answering my questions.
Last but not least my gratitude goes to Martine, for being patient with me during the whole course of my master, including the extra year. When another holiday plan was limited by a contact week in Delft or Enschede. Or when I was coping to do the module 6 project with people living in Spain and Slovenia. I know she knows how important this has been for me.

If you as the reader are just as enthusiastic about the research subject as my supervisors are, I hope you will be inspired to help people shape a better real world environment together in this age of digital communication.

For Tijn

Abstract

In Dutch spatial planning, there are legal requirements for governments to consult the public on designs for spatial developments. Also, the public is often invited to share their views in an earlier stage of the planning process, e.g. through a vote on alternatives. Although this concept of consultation is generally working well, a number of issues have been recognized. These are the limited involvement of the public in planning and policy making, the lack of commitment of governments to take the public's views into account and the position of the consultation phase in the planning process, where the public isn't able to cooperate in the design anymore.

Increasing the involvement of the public and lifting their participation level can very well be done by using the internet. There are many possibilities regarding interactive communication and collaboration, which have been the subject of research and development in recent years. These are commonly known as Web 2.0 or social media. An important part of these possibilities involve mashups of digital maps and location-based information. Both in Dutch municipalities and research projects worldwide, experiments are done regarding the use of social media in participatory spatial planning.

Before further developing this kind of participatory planning, it is worthwhile to investigate the current use of social media, and especially messages that are being published regarding spatial plans. Both the locations being mentioned and what is being said about them is important. Therefore, in this research the way in which geographical and other information regarding spatial plans is being shared through social media is analysed, and an assessment of the enhancement of public participation is made.

To provide a conceptual framework, an overview of the most important social media is presented, and a focus is made on the role of geographical information. Also, Dutch spatial planning legislation is being described, and the role of geographical information in participatory planning through the description of participatory planning GIS. These two aspects converge in a potential new generation of PPGIS, in which social media are being integrated.

Because of the important role of social media in such a PPGIS, social media metrics are adopted from marketing practice as a methodology to analyse and assess the information sharing. This methodology considers a set of key performance indicators in connection the message components location, location based information and information sharer. For participatory spatial planning these are: the number of mentions and the geographic scale of toponyms, the type of location based information that has been shared and the number and nature of information sharers.

The research is done through two case studies concerning participatory planning projects that have been set up in two Dutch municipalities, where social media have been specifically deployed as communication channels. The place names or toponyms that are mentioned in the messages posted in social media have been retrieved, counted and categorized in such a way that the importance of each toponym and the geographical scale is known. The non-geographical portion of the messages is categorized and counted so the kind of contributions people make is known. And lastly the information sharers themselves are analyzed so the involvement of the public is known.

Using the results of this analysis and the performance indicators, an assessment of the added value of the information shared through social media to public participation is done. The assessment shows the information is relevant for the spatial plan, it includes ideas and suggestions for spatial development and it shared by people who do not use other channels. The use of social media does enhance participation in the spatial planning process, or at least shows much potential. Although not many more people are getting involved in creating spatial plans, they are providing constructive contributions to the

plan creation, moving them to or placing them on a higher level on the participation ladder. Validation of these results using information from the two municipalities mostly confirms this.

Geographical information regarding spatial plans is shared through social media by a small, dedicated group of people on an event driven basis, using mostly traditional toponyms to refer to locations that are relevant to the spatial plan. These are characteristics that can be used when developing a participatory planning GIS that incorporates social media.

Next steps in research and development comprise a different, more encompassing way to gather social media messages and/or a case study involving a different, smaller geographic scale. Also, the visualisation of toponyms and location based information on a map is a worthwhile step towards a social media PPGIS.

Samenvatting

In de Nederlandse ruimtelijke ordening bestaan wettelijke verplichtingen voor overheden om de bevolking inspraak in ontwerpen voor ruimtelijke ontwikkelingen te laten hebben. Ook wordt de bevolking vaak uitgenodigd om haar mening te geven in een eerdere fase van het planproces, bijvoorbeeld via een verkiezing tussen alternatieven. Hoewel dit inspraakconcept over het algemeen goed werkt, is een aantal problemen onderkend. Deze zijn de beperkte betrokkenheid van de bevolking in plan- en beleidsvorming, het gebrek aan wil bij overheden om de mening van de burgers mee te nemen en het moment van de inspraak in het planproces, wanneer de bevolking niet meer mee kan werken aan het ontwerp.

Vergroting van de betrokkenheid van de bevolking en verhoging van haar niveau van participatie kunnen zeer goed bereikt worden door gebruik te maken van het internet. Er zijn veel mogelijkheden met betrekking tot interactieve communicatie en samenwerking, die onderwerp zijn geweest van onderzoek en ontwikkeling in de laatste jaren. Deze staan bekend als Web 2.0 of sociale media. Een belangrijk deel van deze mogelijkheden omvatten samenvoegingen van digitale kaarten en locatiegebonden informatie. Zowel in Nederlandse gemeenten als in onderzoeksprojecten wereldwijd worden experimenten uitgevoerd met het gebruik van sociale media in participatieve ruimtelijke ordening.

Voordat dit soort participatieve planvorming verder wordt ontwikkeld, is het lonend om het huidige gebruik van sociale media te onderzoeken, in het bijzonder gepubliceerde berichten die ruimtelijke plannen betreffen. Zowel de genoemde locaties als wat er over gezegd wordt is belangrijk. Daarom wordt in dit onderzoek de manier waarop geografische en andere informatie betreffende ruimtelijke plannen wordt gedeeld via sociale media geanalyseerd, en een beoordeling van de verbetering van publieke participatie gedaan.

Ten behoeve van een conceptueel raamwerk wordt een overzicht van de belangrijkste sociale media wordt gegeven, met een focus op de rol van geografische informatie. Ook wordt de Nederlandse wetgeving met betrekking tot ruimtelijke ordening beschreven, en de rol van geografische informatie in participatieve planvorming middels de beschrijving van participatieve planning GIS. Deze twee aspecten komen samen in een mogelijke nieuwe generatie van PPGIS, waarin sociale media worden geïntegreerd.

Vanwege de belangrijke rol van sociale media in dergelijke PPGIS worden social media metrics overgenomen uit de marketingpraktijk als een methodologie om het delen van informatie te analyseren en te beoordelen. Deze methodologie beschouwt een set van performance indicatoren in relatie tot de berichtcomponenten locatie, inhoud en informatiedeler. Deze zijn voor participatieve ruimtelijke ordening: het aantal

vernoemingen en de geografische schaal van toponiemen, het type locatiegebonden informatie dat wordt gedeeld en het aantal en soort informatiedelers.

Het onderzoek wordt uitgevoerd middels twee case studies van participatieve planvormingsprojecten die opgezet zijn in twee Nederlandse gemeenten, waarbij sociale media nadrukkelijk zijn ingezet als communicatiekanalen. De plaatsnamen of toponiemen die worden genoemd in de sociale media berichten zijn achterhaald, geteld en gecategoriseerd op zo'n manier dat het belang van elk toponiem en de geografische schaal bekend zijn. Het niet-geografische deel van de berichten is gecategoriseerd en geteld zodat de typen bijdragen bekend zijn. En tot slot zijn de informatiedelers zelf geanalyseerd zodat de betrokkenheid van de bevolking bekend is.

Met gebruikmaking van deze analyse en de performance indicatoren wordt een beoordeling van de toegevoegde waarde van de via sociale media gedeelde informatie voor de publieke participatie gedaan. De beoordeling laat zien dat de informatie relevant is voor het ruimtelijk plan, ze bevat ideeën en suggesties voor ruimtelijke ontwikkeling en ze wordt gedeeld door mensen die geen andere kanalen gebruiken. Het gebruik van sociale media verbetert de participatie in het planproces, of laat op zijn minst veel potentieel zien. Hoewel niet veel meer mensen betrokken worden bij het maken van ruimtelijke plannen, leveren ze constructieve bijdragen aan de planvorming, waarmee ze naar of op een hoger niveau op de participatieladder geplaatst worden. Validatie van deze resultaten met informatie afkomstig van de twee gemeenten bevestigt dit grotendeels.

Geografische informatie betreffende ruimtelijke plannen wordt via sociale media gedeeld door een kleine, betrokken groep mensen tijdens participatie evenementen, met gebruikmaking van meestal traditionele toponiemen om te verwijzen naar locaties die relevant zijn voor het ruimtelijk plan. Dit zijn karakteristieken die gebruikt kunnen worden bij het ontwikkelen van een participatieve planvorming GIS waarin sociale media betrokken worden.

De volgende stappen in onderzoek en ontwikkeling zijn een andere, meer omvattende manier om sociale media berichten te verzamelen en/of een case studie die een ander, kleiner geografisch schaalniveau betreft. Ook de visualisatie van toponiemen en locatiegebonden informatie is een waardevolle stap richting een sociale media PPGIS.

Contents

1 Introduction

The current state and issues of Dutch spatial planning are described, and Web 2.0 is introduced as an opportunity to solve some issues. The need to research the status quo of social media in spatial planning processes is stated, which leads to research objectives and questions.

1.1 Research background

1.1.1 Public participation in Dutch spatial planning

The Netherlands have quite a long history of public participation in spatial planning at a local and regional scale. Since 1965 it has been made possible by the Spatial Planning Act to appeal against spatial plans made by regional and local governments (Coenen, 2001). Starting around 1970, this instrument was regarded to be overdue in the whole process of spatial planning. Citizens and organisations were not involved in the creation of the plans and could only disagree on plans already defined and finalized. Different forms of consultation in earlier stages of the planning process evolved at some locations, partly as a result of citizens' protests against projects for urban reconstruction or infrastructure.

It wasn't until 1985 that governments were legally required to make the designs for zoning plans available to the public and offer people and organisations the opportunity to give their opinion about these designs. This is still done by inviting the public to submit written or oral, reasoned responses according to legal procedure and by organising information meetings where people can give their opinion. This happens under the condition that the people responding have a proven interest in the plan.
Also other plans and regulations, such as traffic plans, can be made subject to public hearing and involvement. Because the importance of public participation is recognized, this is often done.

When this legislation and practice is applied to the scale or ladder of participation by Edelenbos (1998) – which is based on Arnstein's (1969) work – it concerns the level called 'consult' as can be seen in table 1. In some cases, mostly where a spatial plan has a high impact on a community because of the scale or the public services involved, the public is invited to 'give advice'. Often this takes the form of a choice between two alternative elaborated plans in the design phase of the planning process. The preferred alternative is then processed into a zoning plan which is made subject to consultation.

Table 1: Ladders of participation

Arnstein	Level of participation	Edelenbos
Delegated power, citizen control	high	Co-decide
Partnership		Co-produce
Placation		Give advice
Consultation		Consult
Informing		Inform
Manipulation, therapy	low	-

1.1.2 Issues

Although the concept of consultation is generally working well, a number of issues have been recognized in the twenty years following the renewed legislation.

One issue is the limited involvement of the public in planning and policy making (WRR, 2005; Min. VROM, 2007). Generally, it's certain types of people and advocacy groups

that make use of the opportunities to have their say at information meetings, through letters or talking with a civil servant at city hall. A fair share of the public is either not willing or not able to take part in the consultation, and participation meetings are dominated by "higher educated, middle-aged men" (Min. V&W, 2003).
A second one is that there's no legal requirement for the opinions and views given by these people to be taken into account by governments when planning decisions are made. As governments can and do neglect citizens' opinions for e.g. political reasons the esteem for this form of participation decreases (Nationale Ombudsman, 2009).
The third issue is the moment of the consultation phase in the process of spatial planning. The plans already have been created, while people would like to be able to change these plans or contribute to them (Coenen, 2001). This means there is a public will to participate on a higher level on the ladder, people that are involved want to be partners at least in the planning process, they want to co-produce and rather co-decide.

1.1.3 Opportunities

The internet is an easily and widely accessible channel that can be used to increase the involvement and lift the participation level of the public (Brabham, 2009). Until now, the internet has mostly been used by Dutch local and regional governments by providing the possibility to express views on spatial plans using a digital form or by e-mail. This is hardly a change compared to the non-digital process, although it takes less effort to fill in and send a form on a website than to write and post a letter. And the share of municipalities that provide means for digital consultation is only 5% (Min. Binnenlandse Zaken, 2010).

But the internet has much more possibilities regarding communication and collaboration, which have been the subject of research and development in recent years.
These are commonly known as Web 2.0, a term coined by publisher O'Reilly (2005) to mark technological developments at that time. Another term is social media, although this applies to possibilities predating Web 2.0 as well, like internet forums. They include phenomena called social networks such as LinkedIn and Facebook, user-generated content like Flickr and Youtube, and crowdsourced information such as Wikipedia and OpenStreetMap. Part of this development is the creating of mashups or combinations of digital maps and many types of location-based information (Batty et al., 2010).

The Dutch national government and other governmental organisations recognize the importance of digital public services and increased participation through the internet and have set up several programmes to this cause, under the label of e-government.
As a result, there's a fairly large number of local governments that are applying old and new communication solutions to citizen participation. 19,3% of Dutch municipalities has made use of a website for participation in spatial planning between 2008 and 2010, and about 14% uses new media to communicate interactively about local policies (Ministerie van Binnenlandse Zaken, 2010). Recent examples of participation projects that somehow involve the use of social media are those started by the municipalities of Alphen aan den Rijn, Zuidplas, Hoorn, Borne and Goes[1].

In other countries, initiatives regarding digital public participation in spatial planning using mash-up techniques and volunteered geographical information have also been developed and researched. These can be seen as a further evolution of participatory planning GIS (Lin, 2011). One example is an experiment in two municipalities in Finland where people could give their view on or information about locations using markers on a digital map, as shown in figure 1 (Nuojua, 2009). Another is an application made by Ryerson University which enables location based discussion about the development of the university campus using argumentation maps as shown in figure 2 (Rinner et al., 2008).

[1] List of Dutch municipal public participation projects: http://www.vng.nl/smartsite.dws?ch=&id=72440

A third is a prototype created and assessed to support urban planning in Canela, Brazil (Bugs, 2010). All three initiatives are obviously map based and therefore have a strong focus on location-based information.

Figure 1: WebMapMedia (Nuojua, 2009)

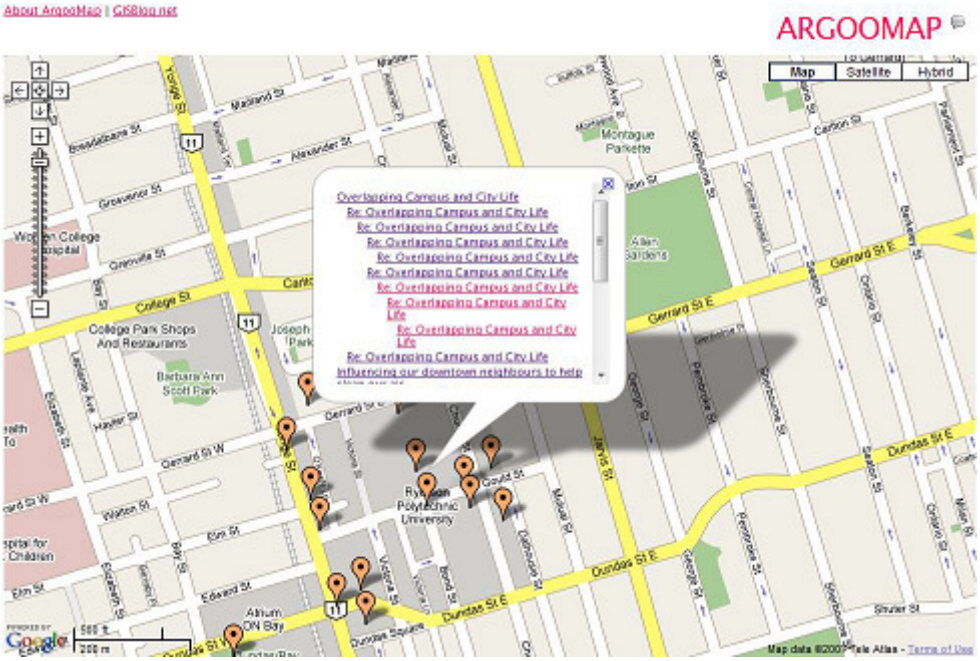

Figure 2: ArgooMap (Rinner et al., 2008)

1.2 Research definition

1.2.1 Research objectives

The current possibilities regarding digital communication and the first experiments and projects using them in the field of spatial planning are promising for solving most of the issues encountered in public participation in spatial planning. These issues are the limited public involvement, both in quantity and quality.
When the concepts behind communication and collaboration solutions are applied to the spatial planning process, especially the early stages, it should be possible to increase both the number of people involved and the level of participation (Brabham, 2009). The goal would then be to enable as many people as possible to have an active and significant role in creating spatial plans for their environment.

Combining Web 2.0 concepts and public participation in spatial planning can not be done properly without first investigating the current use of social media in spatial planning processes. In this research, social media are considered to be used to make announcements or statements about spatial plans and to discuss them. In these messages and conversations knowledge regarding and views on spatial plans can be shared. Such sharing of information is a vital aspect of participatory planning (Healey, 1998a). Because both the locations and areas related to the plans and the actual messages are key information, the investigation into the use of social media should focus on the sharing of both geographical and non-geographical information.

Therefore, the first objective of this research is to analyse in which way geographical and other information regarding spatial plans are shared through social media. The second objective is to assess whether this enhances participation in the planning process.

1.2.2 Research questions

The main questions are derived directly from the research objectives: how are geographical and other information regarding spatial plans shared through social media, and does this enhance participation in the spatial planning process?

The first question is answered by evaluating both the geographical and non-geographical components of the information shared, and the people sharing information.
Considering these three components and the main questions, four sub-questions are defined.

- How are locations represented in social media messages about spatial plans?
- What is the nature of the information that is linked to the locations?
- Who is sharing the information in the spatial planning process?
- What is the added value of sharing information regarding spatial plans through social media to the amount and level of participation?

1.2.3 Limitations

The focus of the research objectives and questions, especially the way in which information is shared, is on the content of social media usage. Another obvious angle to approach the objectives would be the technology used, for example the (mobile) devices. The research is restricted to spatial plans located in The Netherlands for two reasons. The research is considered to be a stepping stone towards the enhancement of the Dutch spatial planning process in particular. And the foreseeable amount of information that could be analyzed is limited in this way to comprehensible proportions.

1.3 Reading guide

Before the research questions are answered, information on social media, participatory spatial planning in The Netherlands and the role of geographical information in both is provided in chapter 2. Then a research methodology which matches the research questions is defined in chapter 3. Execution of the methodology and the following results and observations are described in chapter 4 and 5. These research results are discussed in chapter 6, where the questions are answered and the results validated. Also, some recommendations are made there for further research.

2 Social media, participatory planning and GIS

Information on social media and the role of geographical information is provided. Also, participatory spatial planning in The Netherlands and participatory planning GIS are described. A potential new generation of PPGIS which uses social media is introduced.

2.1 Overview of social media

A wide variety of social media applications is available on the internet. The most popular applications have been arranged in a set of main categories: weblogs, social network services and user generated content.

2.1.1 Weblogs

Also called blogs, weblogs are websites where one or more people publish (short) texts and other information which are displayed in reverse chronological order.
Readers can respond to the publications or posts by writing a comment. These responses can also be used to discuss the matter at hand, as the weblog author can write comments himself. The posts are accessible in an archive, can be categorized using key words and linked to from other websites.
Weblogs have started out as online public diaries, but have found many applications since. Companies and organisations use them to inform the public about products and services. Also, several genres of weblogs have arisen, including hyperlink, political, travel, art, music and journalism blogs.
Weblogs can be created using a hosted service e.g. Blogger or LiveJournal, or software installed on the website's server like Wordpress and Movable Type.

In the past five years, a special kind of weblog has risen to significant importance. Using a limited amount of text, microblogs provide status updates about people or organisations, links to other resources, single pictures or videos. The messages can contain keywords or tags by which they can be searched and organised. Also, a user of a microblogging service can follow other users, meaning the messages written by those users are grouped together and provided in one view to the user.

The best known application is Twitter. Messages created with Twitter (tweets) can be 140 characters long at most, which actually was derived from the length of a SMS message. Tweets can be used to publish information, and by including the username of another Twitter user they can also be used as public or private messages to that user. This and the feature of having followers have given Twitter some characteristics of an online social network.
Other services, which allow longer messages, images and other information include Tumblr and Posterous. Also, services such as Yammer are available for closed company networks.

2.1.2 Social network services

Another important development on the web in the past decade has been the evolvement of social networks services. These are websites where people can represent themselves and connect to other people they know or that share a certain interest. Users can share all kinds of information, such as a weblog, status updates, pictures, videos, music, events and applications, and others can comment on them. The largest social network services focus on real-life networks, but there are also many services dedicated to special interests.

The largest general social network is Facebook with 901 million users active at least monthly worldwide in March 2012[2]. But other services such as Google+ and Myspace are available, and there is a number of services that has a significant local share of users, e.g. Qzone in China and Hyves in The Netherlands.
An example of a service with a target user group is LinkedIn which is used by professionals to connect to each other. Social networks can also be created by interest groups using hosted services. One of such services is Ning, which for example is the basis for the Dutch "Ambtenaar 2.0" (Civil servant 2.0) network.

2.1.3 User-generated content

A large number of websites is available to share pictures and videos with the rest of the internet users. Image and video files can be uploaded and then entitled, tagged and organized. Other users can comment on the photos and videos using text, ratings or recommendations. Website users can associate by becoming contacts or members of groups. Among the most popular picture-sharing websites are Windows Live Photos, Flickr and Photobucket. The most popular site for sharing video is Youtube, others like Vimeo fall far behind[3].

Just as there are ways to share visual content, there are services for sharing and building information and knowledge. The general term for websites where this is done using mostly text is wikis, with Wikipedia as their best known example. In a wiki, anyone who has access to it can share information about subjects creating (encyclopaedic) articles, and others are free to edit it if they see shortcomings in the information. Discussion can take place about these shortcomings, and through editing and discussion a wiki's quality is improved by the people using it.

2.2 Geographical information in social media

2.2.1 Volunteered geographical information

Like visual content and knowledge, geographical data and information can also be created and shared by people. This kind of map-making by both professional geographers and non-professionals is called volunteered geographical information or VGI (Goodchild, 2007).

Creating and editing a map of the world itself is done in the OpenStreetMap project by volunteers using GPS devices and gathering existing geographical datasets. Google also gathers volunteered geographical data for their maps in areas that lack map data, for this they provide the Map Maker service. The difference between the two is that Google gets the rights to the data, while OpenStreetMap data is freely accessible.

Describing locations and areas can be done using Wikipedia by adding geographical coordinates to articles, enabling the display of the articles on a map interface, and WikiMapia, which allows the users to draw areas on a map of the world and add a description to it.
In another way, Panoramio enables the users to share pictures via Google Maps and Google Earth, provided the images have a geographical reference and portray the environments of the location in a neutral way. This way, Google can enhance its geographical services with visual content generated by its users.

[2] http://newsroom.fb.com (visited 25-6-2012)
[3] according to Alexa Internet (www.alexa.com, visited on 25-6-2012)

Public participation is occurring when incidents or events at geographical locations are registered to help others. For this, a platform such as Ushahidi can be used. This was created in Kenia after the 2007 presidential election to collect and share eye-witness reports about the following violence. Ushahidi means witness or testimony in Swahili. The software developed then has been used later on at other occurrences of violence, during natural disasters, for recording crime and traffic hazards and environmental issues. A hosted version of Ushahidi is available called Crowdmap.

Figure 3 shows views of Wageningen in OpenStreetMap and WikiMapia, and an implementation of Crowdmap by Prague citizens concerned with issues of urban planning.

Figure 3: Openstreetmap, Wikimapia and Crowdmap (praguewatch.cz)

2.2.2 Location based information

In microblogging, content sharing and social network services, location information which is derived from a computer's or mobile device's location can be attached to the message or content which is posted by the user. Also, social networks such as Facebook allow the users to mention locations and venues they have visited. And thirdly, place names can be part of messages or the description of pictures or video. Using these location data, others can gather (real time) information about many locations (Sizov, 2010; Naaman, 2011).

Specific location based social network services have been developed as well, mainly for mobile devices. These are centred around real world locations which users can connect to ("check in") when they are actually there, rather than around people or interests, often offering virtual or real business-to-customer awards to the user. These locations are identified either by the location of the mobile device or by selection by the user. Notable services that are available at the moment are Foursquare and Loopt.

Figure 4 shows popular or trending topics on Twitter for Amsterdam, and Foursquare locations in Utrecht.

Figure 4: Twitter trend map (trendmaps.com) and Foursquare venues (4sqmap.com)

2.3 Spatial planning in The Netherlands

To provide a conceptual framework, an overview of the Dutch legislation on spatial planning and participation is provided, and also of non-mandatory, interactive public participation that could allow for co-production to occur. The main two types of spatial plans are being described: structural visions and land-use plans. Both types of plans and their procedures have been defined by the Spatial Planning Act and Decree of 2008.

2.3.1 Structural visions

At all three governmental levels, national, provincial and municipal, structural visions are established for the whole administrative area by the relevant governmental and elected bodies. These visions describe one, more or all aspects of the planning policy for the area, and define the outlines of future spatial development, the main issues of planning policy and the way in which development is to be executed. They are strategic documents that are not legally binding for others than the authors themselves. The visions are to be elaborated into land-use plans.
At provincial and municipal level, structural visions can be defined in cooperation with neighbouring administrative areas.

Often, there is no fixed procedure or format for the structural vision in the legislation, this is left to the governmental body that establishes the plan. But there are regulations that can define parts of the procedure regarding specific aspects of spatial development, such as environmental policy or water management.

De facto, structural visions have been the result of consultation between different governmental levels and bodies, and non-governmental organisation in the past decennia, with good results. For this reason, there are no specific regulations for public participation, only the obligatory local rules for consultation are to be followed. To promote public participation in earlier phases of the planning process, structural visions should contain a description of how civilians and organisations have been involved in the preparation. In these preparation and design phases, there are opportunities for interactive public participation.

2.3.2 Land-use plans

As land-use plans are legally binding for others than the municipality, the procedure for establishing them is much more regulated.

A municipal council establishes one or more land-use plans for the whole area of the municipality. These plans describe the use of the grounds and contain regulations regarding the use. The land-use plan is valid for a period of ten years, at the end of this period the plan has to be renewed through either re-establishment or prolongation.

The municipal council first decides on the preparation of a land-use plan, and publishes a declaration of this decision. It contains information on where and when documents are deposited for public inspection: at the municipal hall and website for a period of six weeks. The decision is also available through a national digital service called RO-Online.

Next, the council establishes a draft for the land-use plan. This draft is made public in the same way as the preparation decision. Also, notifications are sent out to the national government, the province, water boards and involved municipalities, as well as the owners of involved grounds. Within a period of six weeks, anyone can state a motivated view on the draft to the council. This view can be made in writing, orally or, if the

municipality allows it, through a digital channel. This is where the obligatory public participation happens, in the form of consultation.
The council decides on the adoption of the land-use plan within twelve weeks after the period of public inspection, and publishes this decision within two weeks.

The draft can be preceded by a preliminary design. A municipal regulation on public consultation describes in which way this design is to be published and which means for consultation are available to the public. It's also possible but not required to have some form of interactive participation in this phase.

Before the described legal procedure can be followed there has to be at least an initiative for a spatial development. This initiative can be taken either by the municipality, a higher level government, or a (commercial) organisation or individual (Tunnissen, 2009). In most cases, it is the municipality that starts to look for possible redevelopment of a location or area, or a suitable location for a required development. Often, this initiative has its roots in a structural vision which has been established for the whole municipal area.

Once an initiative has been taken, the strategic and/or investigation phase start. As these phases are not subject to legislation but rather defined by experience, best practices and the scale of a municipality, the contents of these phases may differ. Amsterdam's Plaberum (The planning and decision-making process for spatial measures, 2006) describes well what should be done in these phases for a large municipality, and can be taken as a good example.
In the strategic phase, the feasibility and desirability of a spatial development are examined by identifying the possibilities, the risks, the partners involved and the financing. When this phase is concluded by a decision to go ahead with the development, further and more detailed investigations are made in the next phase. These investigations look into all spatial and non-spatial aspects of the proposed development and result in, amongst other products, sketches and designs. In this phase, the involved partners that have been identified earlier can participate in some way.

Once the land-use plan has been established and the developments have been executed, the planning process reaches its final phase. The location or area is being used by the public and managed by the municipality, and over time the plan is being evaluated both implicitly and explicitly. The inhabitants and/or visitors can give off signals of how they value their environment to the municipality, and the municipality in their turn can monitor the citizens' assessment as a way of policy control. This can be done in collaboration with representatives from the public. (Cavenago, 2010).

In the overall process of land-use planning, three phases can be identified where public, interactive participation can be organized: investigation, preliminary design and evaluation. These phases complement the obligatory, less interactive consultation phase.

2.4 Participatory planning and geographical information

Spatial planning and geographical information are by definition strongly linked: data and information about locations that are to be developed is needed to create plans and policies. When the local community gets involved in the policy making, tools are needed for data gathering, analysis and presentation. Sieber (2006) describes how geographic information systems or GIS became the tools used by grassroots groups for enhancement of public participation in spatial planning and other policies. In 1996 the term public participation GIS or PPGIS was introduced to define a new generation of GIS (known as GIS/2) which are available to all stakeholders in policy making. Later on, the term participatory GIS (PGIS) was also introduced, but PPGIS is mostly used.

PPGIS have taken many forms, both in a technological sense and in an organizational sense. Regarding the latter, both the top-down approach where planners take the initiative and the bottom-up approach by communities and non-profit organisations are known.

Miller (2006) at the same time says how difficult it has proven to create real life, working applications of GIS/2 that match the paper definitions and actually help society. With a few exceptions, there haven't been successful implementations of the vast and divers body of theory.
But according to Miller, mashups could change this though, online services created from combined software and data. He especially mentions the launch of Google Maps, which not only allows easy browsing of maps, but also the addition of third party data as overlays. And as not many skills are needed for this, a lot of people can start to create their own simple PPGIS, combining and displaying e.g. crime data. He calls it 'a beast, matching up very well with most of the going definitions of GIS/2'. Especially when users can freely add their own information to the map, as was done during hurricane Katrina, and it becomes a true participatory GIS.
Flanagin (2008) considers such volunteered geographical information as either an extension or a more inclusive version of PPGIS as described by Sieber and Miller respectively.

And indeed, in the last few years a number of Web based PPGIS using the principles of mashups and VGI have been developed. Three examples have been mentioned in the introduction of this research: an experiment in two Finnish municipalities, an argumentation map by Ryerson University and a prototype that support urban planning in Brazil.

2.5 Convergence of PPGIS and social media

Taking this evolution further, the logical next step would be to include microblogging and social network services such as Twitter and Facebook in PPGIS as means of communication. This is indeed being done, with for example a WebGIS application aimed at reporting abandoned building sites in North-Carolina, USA that have potential hazards for water and soil (Werts, 2012). Reports done at the web site are also displayed on a Facebook page, providing one-way communication towards the public.
On the other hand, people can use social media to organize themselves in relation to spatial developments, often to oppose them. But the planners do need to know about such Facebook groups that exist, else there isn't actual participation happening (Evans-Cowley, 2010).

PPGIS with a full inclusion of social media would mean people posting messages about locations using their favourite application. Government services then gather, analyse and possibly visualize these messages, and may respond to them.
Depending on whether a participation project is announced or responses are actually posted, people may not know they are actually participating at first, or never at all. Being transparent about this or not is a matter of good governance (McCall, 2003).
The PPGIS may not appear as such to the public, as there is no WebGIS application necessary. But behind the scenes, at the planner's office a GIS or at least a map will be needed to record and georeference the messages.

A transport authority can start conversations with travellers who are using specific key words in their messages such as 'traffic' in combination with a relevant location, to gather more information (Evans-Cowley, 2011). Or mood maps of a city can be created which can be used as a tool for urban planning and management to spot problem areas (Abdalla, 2011).

This is a dawning generation of PPGIS, which very well matches the opportunities using Web 2.0 to increase both the participation level and the involvement of the public in spatial planning. As social media are starting to be used in this way in participatory planning practice by a number of Dutch municipalities, the research of these planning projects concerns the status quo of such social media PPGIS.

3 Methodology

To analyse how geographical and other information about spatial plans is shared through social media, and to assess whether participation in the planning process is enhanced, a methodology is introduced to assess this new type of participatory planning GIS. It borrows from established social media analysing techniques used in marketing, discerning three components of social media messages about locations.

3.1 Framework

The research is done by means of a limited number of case studies. A case consists of a spatial planning project initiated by a governmental organisation, which is using social media as one of the channels for public participation.
Within a case, the content concerning the spatial plan shared through social media is analysed to discover which information is shared and how it is shared. Using these findings, the enhancement of the amount and level of public participation as an effect of the use of social media is assessed. This is in fact an assessment of the social media driven PPGIS that are being used in the case studies.

For the assessment of PPGIS, several frameworks have been created in the past that try to include some or all aspects of participatory planning.
Laituri (2003) considers components of access to PPGIS to evaluate a number of case studies, but knowingly does not include levels and types of participation. McCall (2003) focuses on governance criteria, and also looks at degrees of participation. Vonk (2005, 2007) considers the supply and demand of planning support systems, identifying bottlenecks on the demand side and fits between user, technology and planning tasks. Koekoek (2008) identifies a set of normative and instrumental functions of e-participation, including the level of participation, and considers a number of related potential obstacles to assess three projects.

For the new kind of PPGIS in which social media play such a great role, using a framework that is relevant to this technological and social development is required. Therefore, social media metrics are introduced as the base for the research methodology. After a description of the elected case studies, this chapter will follow the structure of the four research sub-questions: locations, location based information, information sharers and assessment of added value.

3.2 Social media metrics

3.2.1 Social media assessment in marketing and public participation

Analyzing the content and usage of social media regarding a certain subject to assess the effect of the deployment of social media as a communication channel is a practise well known in current day commercial marketing. It is called social media metrics.
In the field of marketing, it concerns observing discussions about brands and products in social media and analysing them using dedicated software (Dörflinger, 2011). This can be done to measure the effectiveness of an advertising campaign, and also to continuously monitor the image of a company.

As in every research or survey project, social media metrics involves using a methodology ensuring valid and useful results. It starts by designing a set of metrics or key performance indicators that follows from the objectives of the campaign or the company. These indicators can be both quantitative (number of messages or authors) and qualitative (topics and sentiment). A set of targets related to the metrics is defined

to enable drawing conclusions on the effectiveness of a campaign or on the image of a company (Murdough, 2009).
The results are often summarized and displayed in dashboards such as shown in figure 5, including a map visualizing the geographical reach or spread of the campaign.

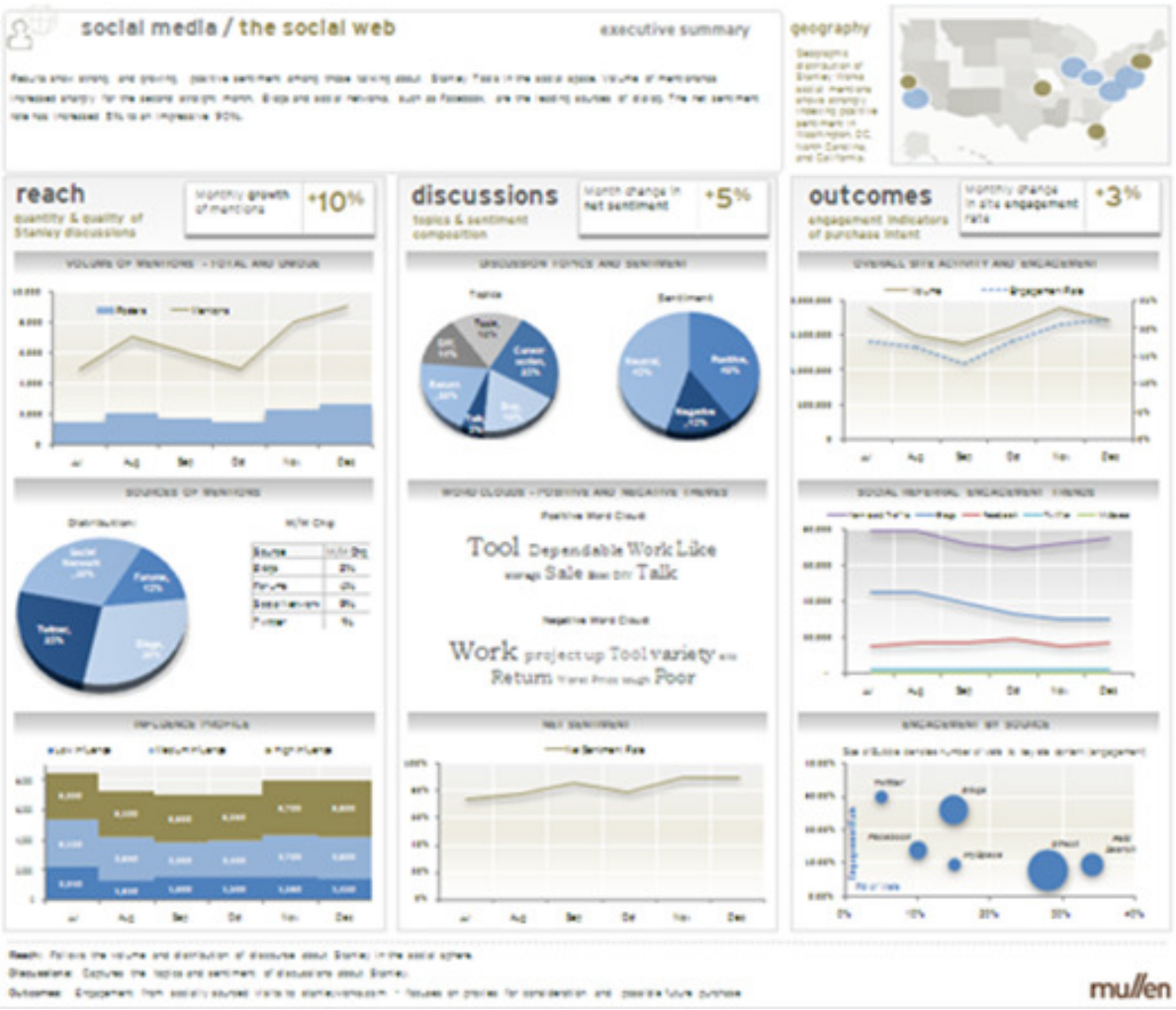

Figure 5: Social media metrics results (Murdough, 2009)

Online advertisers have been accustomed to using only quantitative metrics such as the number of page views and visitors (Fisher, 2009). To help them measuring the return of investment on social media campaigns, the Interactive Advertising Bureau (2009) has published a set of metrics for each of three types of social media: a general set for web sites, and specific sets for weblogs and applications. Examples of these metrics are interaction rate, conversation size, site relevance and audience profile. But these metrics still are all quantitative according to several experts in the field who continue to argue for real qualitative indicators such as sentiment, attitude, rating and content (Fisher, 2009).

Measuring the effect of public participation in social media can be seen as an alternative form of this practise. Instead of products and brands, locations or public services are being discussed. As with advertising, both the number of people being engaged and how they are engaging, what they are saying is equally important. Social media metrics have already been adopted in a way akin to that in marketing by city and county governments who want to engage their residents through social media and measure the effect of their efforts (Shark, 2010). A comparable methodology can be used to assess whether social media PPGIS enhance the level and amount of participation. The framework introduced here is specifically aimed at these issues encountered in participatory spatial planning.

3.2.2 Key performance indicators for participation

This research intends to measure the added value of sharing (geographical) information about spatial plans through social media. For this, matching key performance indicators are defined. This is done keeping in mind the issues and goals regarding public participation: involving more people and letting them create plans for their environment.

The first key indicator is the locations that are being discussed, and especially whether they are representative for the spatial plan being discussed. Having relevant discussions is considered to be a condition for effective participatory planning. The scale of the locations or area that are mentioned as well as the number of mentions are metrics for the relevance.

The added value of sharing information about spatial plans can be measured partly by focusing on the content in which the level of participation is reflected. When people mainly give their opinion about plans and places, they are the level of consultation or advising according to Edelenbos (1998). But when they're proposing their own ideas or solutions, they are on a higher level as they are co-producing.
So the type of location based information is the second key performance indicator for public participation in social media.

The third key indicator also relates to the known issues regarding public participation. The number and nature of information sharers can be used to assess whether more people i.e. residents are involved in participation.

During the analysis of the social media messages, the occurrences of the three message components location, location based information and information sharer are interpreted, classified and/or counted, in an appropriate order. This way the actual measurements are done, the results lead to the assessment of the enhancement of public participation.

3.3 Cases and sources

The first and crucial step in this research is the selection of spatial planning cases that are studied and the information sources that are used. It is crucial because this step defines the amount and nature of information that is available for analysis. The cases define the information sources, as each case has its own fixed set of social media channels being applied.

In The Netherlands, so far there have been a few public participation projects concerning spatial planning where social media have been used as a means of interactive communication. Two of them are noteworthy because social media play a great role in the process.

These are the participation projects set up by the municipalities of Alphen aan den Rijn and Zuidplas as part of the process of creating a structural vision for the municipal area. The locations of the municipalities in the Randstad metropolitan area are displayed in figure 6.

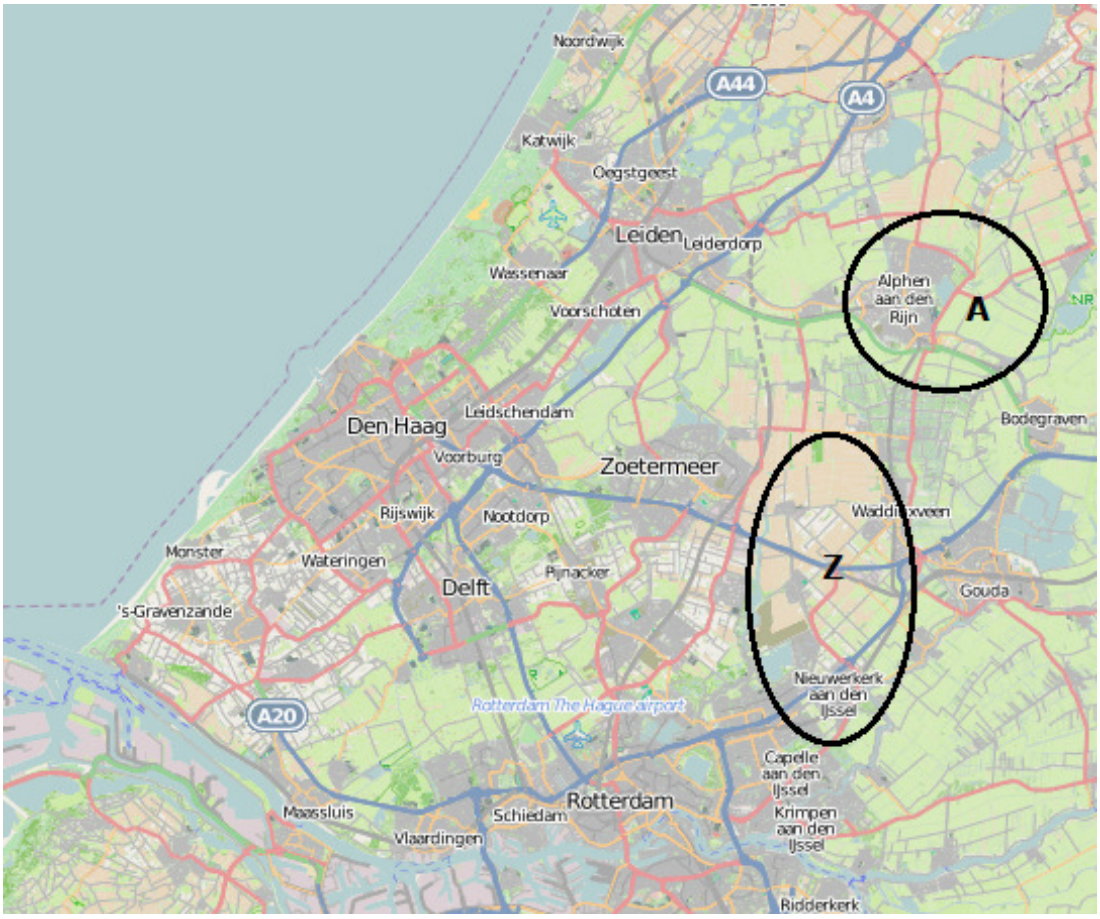

Figure 6: Location of Alphen aan den Rijn (A) and Zuidplas (Z) in the Randstad area

The project initiated by the municipality of Alphen aan den Rijn is called 'De stad van morgen' (The city of tomorrow). Highlights of the project were a 'Week of the structural vision' from 1 to 5 November 2010 and a municipal council meeting on 25 May 2011. During the week in November, the citizens of Alphen were invited to share their opinions and ideas on the future of the municipality through one or more channels: participation evenings, workshops, a dedicated website and social media. All of the input has been processed in the following weeks and months, and in May the results were discussed by the municipal council. During this meeting, the public again could take part in the discussion using social media.

The project's concept was soon adopted by the municipality of Zuidplas which also needed to create a structural vision for their area. Their project has been called 'Qwiek', which can best be translated as 'Brisq', derived from brisk. It started with the 'Week of the vital villages' from 14 to 19 March 2011. As in Alphen aan den Rijn, input for the structural vision was gathered through both live meetings and digital channels (a website and social media). The results were presented in a report in April 2011, and the project's name is being kept in use for further participation events.

Both projects make good study cases as thousands of messages are available from the social media channels that have been used. The channels used are Twitter, LinkedIn, Facebook and Hyves. Each of these channels has its own term for messages (tweets, comments, posts), in this document the generic term 'messages' is used.
Almost all of the messages have a textual content, which can include an address of a web page. The analysis in this research will focus on all immediately available texts in the social media messages.
In both cases LinkedIn and in Qwiek's case Facebook and Hyves have been used by the project organisation to pose statements to spark discussions.

The participation projects are quite similar as the concept, the websites[4] and the social media accounts have been set up by the same (commercial) organisations. The projects do not only involve spatial development but also social and economical aspects, especially in the case of Zuidplas which is aimed at keeping or creating vital communities.

3.4 Locations

The first part of the analysis of the gathered information focuses on the geographical component. From the textual messages that have been posted in both projects, terms and names referring to a location or area are deducted. These terms and names are in fact place names or toponyms, whether they are of an official nature or colloquial as may be expected from social media. Not all messages will contain a reference to a location or area, because the participation projects also involve non-spatial development of the municipality, and messages can also be about the projects. These messages are put aside and aren't part of any further analysis.

Deriving toponyms from texts and especially connecting them to the intended location poses challenges because of the ambiguous nature of place names. The most important cause for this is the use of the same toponym for different locations. This can be both coincidental, e.g. a place named after a common landscape feature or an important person, and intentional because e.g. during colonization places get named after each other. Context is often needed to know which of the available options is to be used. This is especially true for social media sources because of their limited amount of information and informal nature (Ireson, 2010).
Automated procedures to derive toponyms from texts are theoretically possible, using dedicated software and toponym databases such as GeoNames[5], although a satisfying evaluation of these procedures poses a challenge (Leidner, 2006).
In this research though, the toponyms are derived manually by reading all of the available messages. Considering the volume of research data this is the most practical method and the data needs to be reviewed manually anyway to find toponyms not included in any toponym database that could be applied. There is the risk of missing or incorrectly registering toponyms.

To discover which locations got importance during in the participation process, an analysis is done which includes counting the number of times every unique toponym has been used in total. In addition, developments in importance are analysed by doing a usage count for a certain interval of time for a selection of the most used toponyms.

At what geographic scale are people discussing the spatial plan is discovered by determining the geographic scale of each toponym. This is done by matching the toponyms to a simple geographic ontology. This ontology, displayed in table 2, is derived from the GeoNames feature classes and codes by listing the most probable values first, and adding missing entries to the list during the analysis. For administrative areas and settlements a classification based on size and relative position is used. For the other categories – water, area, infrastructure and feature – the characteristics of the geographic entity are used as a discerning factor. The geographic scale is less obvious for these, as the functions of the entities are divers and most entities can have various sizes. But there is an order of magnitude imaginable: e.g. a park is most often larger than a square, just as a province is likely to be larger than a municipality.

[4] www.destadvanmorgen.nl and www.hoeqwiekbenjij.nl
[5] www.geonames.org

Table 2: A simple geographic ontology

Administrative	Water	Area	Settlement	Infrastructure	Feature
continent country region province area municipality border	lake river canal harbour	park polder square recreation mall nature residence	populated place section locality	road street path junction railroad path airport	building bridge station bus stop underground other

This analysis of toponyms gives a first insight into the way spatial plans are being discussed in social media, mainly regarding which and what type of locations.

3.5 Location based information

The non-geographical portions of the information enclosed in the messages are extracted so the nature of this part of the information can be determined. It can be either objective, providing verifiable facts about a spatial plan, or subjective, giving opinions or sentiments (Pang, 2008). Subjective information regarding spatial plans can also include proposals for alternative developments.

Analysis of the content of social media messages to discover the nature of the content has been done in other research projects, such as one regarding mentions of H1N1 or swine flu on Twitter (Chew, 2010). In that research, the messages have been assigned to one or more categories which were been defined after a quick scan of the research data. Such an approach is very appropriate here, provided the categories should be representative for public participation projects. In these projects people can give their views on the current or future situation, make their own proposals for changes and improvements and ask questions (CentrumPP, 2011). In addition, they can discuss the project itself, or pass on other peoples' views.

This results in the following six categories of location based information: fact, question, opinion, idea, event or report. They aggregate to two main categories, as events and reports are related to the planning process and the others relate to the spatial plan. These categories are described in table 3.

Table 3: Categories of location based information

Category	Description
fact	objective information, verifiable by external sources
question	request for facts or opinions
opinion	positive, neutral or negative comment
idea	suggestion for spatial development
event	a participation project or a specific meeting
report	account of a meeting or second-hand information

All messages containing one or more toponyms are read again, and tagged with one or more of the six categories. The tags are then counted after which the counts are used to further enhance the insight in the way spatial plans are discussed in social media. This especially concerns the level of participation that occurs in the participation projects.

3.6 Information sharers

The final part of analysis focuses on who are sharing the information and their involvement in the spatial planning process. This is a matter of discerning the social media users that are creating messages and having conversations. These users can be

considered to form a dedicated social network. As such, the relationships between the users can be analysed using the established principles of social network research (Scott, 2010), enhanced with techniques aimed at social media (Menon, 2010).

This research though doesn't aim at such an elaborate analysis, as not the network but its contribution to the participation is important. A basic impression of who is sharing information and at what magnitude will provide sufficient information to measure the involvement of people in the participation process.

Thus, the social media users who have been involved in the participation project are counted and categorized. The most important distinction between users is whether they are civil servants working at the municipality and therefore involved in the project professionally, or civilians at whom the participation project is aimed. This is done with a respect to their privacy, i.e. the data is made anonymous. Also, the number of messages they have sent are counted to analyse how involved each user has been in the participation.
Lastly, for each user the involvement in other 'offline' participation is ascertained by looking for content in the user's messages that relates to meetings or other events. Also statistics are gathered about the number of inhabitants in the municipality and the usage of social media.

3.7 Assessment of added value

The acquired insights through social media metrics on locations, location based information and information sharers are used to draw conclusions about the added value of the information shared through social media to public participation.

The added value is defined by the issues and goals described earlier: involving more people in public participation at a higher level on the participation ladder. Also, the information shared should be relevant to the spatial plan. Three key performance indicators have been defined for the participation projects using social media: the number of mentions and the scale of toponyms, the type of location based information that has been shared and the number and nature of information sharers. The acquired insights are matched to the performance indicators to assess the added value.

The toponym usage regards the relevance to the spatial plan. When the toponyms are representative to the plan being discussed, both by location and scale, the information shared through social media can be used directly in the public participation. When people are mainly discussing at a different geographic detail level or about locations outside of the plan area, they could be either expressing they have different interests, or they are considering important spatial relations with other areas and locations.

The type of location based information has a relation to the participation level. When people are giving opinions about the plan, they are participating at a lower level than people who are sharing ideas and creating their own plans.

Lastly, the number and nature of information sharers lead to the amount of civilians participating only through social media and their share in the total number of inhabitants and social media users. These are the people that aren't involved through meetings and add to the amount of participation.

The assessment is validated when discussing the research results. For this, the project evaluations done by the municipalities are used, either through publicly available reports or an interview conducted with experts.

4 Execution

The research methodology is elaborated and detailed regarding the gathering of data and the analysis of the three message components.

4.1 Data gathering

The messages that have been sent using Twitter are available from public archives created for the participation projects at the Twapperkeeper website. For the Alphen aan den Rijn project, two archives are available: one for the messages from the @morgenisvanjou Twitter account and one for the messages with the #dsvm hashtag. For the Zuidplas project, an archive is available for the #qwiek hashtag. Hashtags are used in Twitter as keywords to facilitate easy search and recovery of messages on a certain subject.
All archives are copied, and in the case of the #dsvm archive cleansed because 'dsvm' sometimes occurs as a term or part of an URL in irrelevant messages as well. Double messages (from the @morgenisvanjou account using the hashtag #dsvm) are removed. Extra sources for messages with the #dsvm hashtag are the Twitter accounts created for the 'De stad van morgen' workshops: @atelierkwali for spatial quality, @atelierboeiend for intriguing living and @ateliercompact for the compact city. The messages from these accounts are also copied.

From the LinkedIn groups and Qwiek's Hyves and Facebook accounts all discussions are copied. The Morgenisvanjou accounts at Hyves and Facebook do not contain any messages relevant to this research. No discussion has taken place there and the Facebook account mainly contains republished messages from the Twitter account and links to other information sources such as images and videos. So these two accounts are disregarded.
The web links to all of the data sources mentioned are available in appendix A.

4.2 Locations

Each unique toponym is registered and the number of occurrences is counted using the Notepad++ text editor. Lists of toponyms and counts are put in Excel spreadsheets so they can be sorted by the number of occurrences or alphabetically (see appendix C).

The count of toponym usage frequency is done for a monthly interval. For this the date on which the message has been posted is used. A count per month is chosen because the research data elapse a half to a whole year, seven to twelve time frames should give a good indication of developments in importance during the process.

For this part of the analysis, the focus is on the messages posted on Twitter, as this social media platform is expected to provide the most opportunity for spontaneous contributions and discussions over time. The other social media have been used mainly for discussions sparked by the project organisers during the participation weeks, therefore toponym usage doesn't occur or develop outside of these time frames.

4.3 Location based information

The messages containing one or more toponyms are tagged with the six categories describing their content. The tags are then counted using the Notepad++ text editor.

Some translated examples for each category from De stad van morgen Twitter messages are provided below. These are messages that have just one tag, so they belong to a

single category. There are also those that belong in two categories, examples of these are also provided.

Fact: *Recent research has shown that #Alphen does NOT have shrinkage. The need for houses is poignant. Waiting lists longer than 5 years!*

Question: *Will starting companies get an affordable location along the Rhine?*

Opinion: *Old Rhine zone, take care of execution! Brings a lot of good towards 2031*

Idea: *Treinweg/ooskanaalweg super water recreation area with passage to nieuwkoop!*

Event: *25 May council commission on the future of Alphen aan den Rijn will you be there?*

Report: *Also better access Kerk en Zanen and improvement livability Eisenhowerlaan have been mentioned*

Fact+opinion: *There's a tractor driving through the suburbs… this way Alphen keeps its village character*

Fact+idea: *There are a lot of mostly unused bike stands under the Rijnplein shops, entry Fossapad. Advertise those?*

Question+opinion: *Would like to know what #alphen should be in 2030? cultural city? industrial city? reaction city? or will it stay a dormitory village?*

Question+idea: *why not do something good with the area between Treinweg and Oostkanaalweg?*

Question+report: *Today in #ADGH an article in which is stated there should be more bike stands on the Rijnplein. What's you're opinion?*

Opinion+idea: *Identity Alphen? Needs to be worked on. Give culture an impulse! Alphen can become the event city of the Green Heart for example*

Opinion+event: *thnx, indeed selling alphen, nice city, beautiful Old Rhine, events, zegerplas etc*

Report+opinion: *VVD says in debate about by-pass that developing Gnephoek is a myth but invalidates that themselves each time Looking for financing by-pass*

Report+idea: *RT @nieuwsrotterdam Possibly floating swimming pool in Rotterdam Rijnhaven http://j.mp/rgLJJy Something for #dsvm ?*

4.4 Information sharers

For comparison, the total number of inhabitants and social media users in the municipalities are needed.

The number of inhabitants above 15 years old for each municipality on 1 January 2011 according to the national Central Bureau of Statistics is retrieved from their Statline website[6].

[6] http://statline.cbs.nl

There aren't really reliable and unambiguous statistics available about the number of Twitter users in The Netherlands in the last months of 2010 and the first months of 2011. One linguistic research concerning social media by Tjong Kim Sang (2011) reports 790000 accounts with at least one message posted in Dutch in January 2011. Because these accounts also include users mainly in Belgium, the number of accounts has to be matched against the number of Dutch speaking people (about 23 million). This means about 3,4% of the Dutch population is posting messages on Twitter.

A second source is a research by Poblete et al. (2011) on social media behaviour in different counties, which used Twitter accounts with a valid geographic location entered in the user profile. For the Netherlands, this resulted in 86863 active accounts in November 2010 within the Netherlands. This result can be coupled to a research by Hecht et al. (2011) on the usage of the location field in the user profile. That shows 66% of Twitter users in the United States provide a valid geographical location. Combining these numbers, about 0,8% of the Dutch population (16.6 million people in January 2011) would be active Twitter users.
Assuming the truth is somewhere in the middle and taking into account corporate and institutional Twitter usage, for this research a coverage of 2,0% of the Dutch population is used.

LinkedIn usage is more reliably established: in January 2011 there were 2.1 million LinkedIn accounts owned by people in The Netherlands, on a population of 16.6 million this means 12,6% uses this social network.

These percentages are used in combination with the number of inhabitants to estimate the number of active Twitter and LinkedIn users in the two municipalities.

5 Results

For each part of the research methodology the results of the analysis are given, often in the form of tables, graphs and figures, and observations are made about them. It starts with the locations, then the location based information and information sharers follow. In the last section, the added value of (geographical) information sharing through social media to public participation is assessed using these results and observations.

5.1 Locations

5.1.1 Amounts of messages and toponyms

Table 4 show the total number of acquired messages per project and social media source and the number of messages containing one or more toponyms. The percentages of messages with toponyms are depicted in figure 7.

Table 4: Number of all messages and those containing toponyms

Project	Social media source	Total number	With toponym(s)
Qwiek	Twitter Facebook Hyves LinkedIn	1752 343 23 86	289 96 13 58
De stad van morgen (Dsvm)	Twitter LinkedIn	2285 99	677 71
Overall total		4588	1204

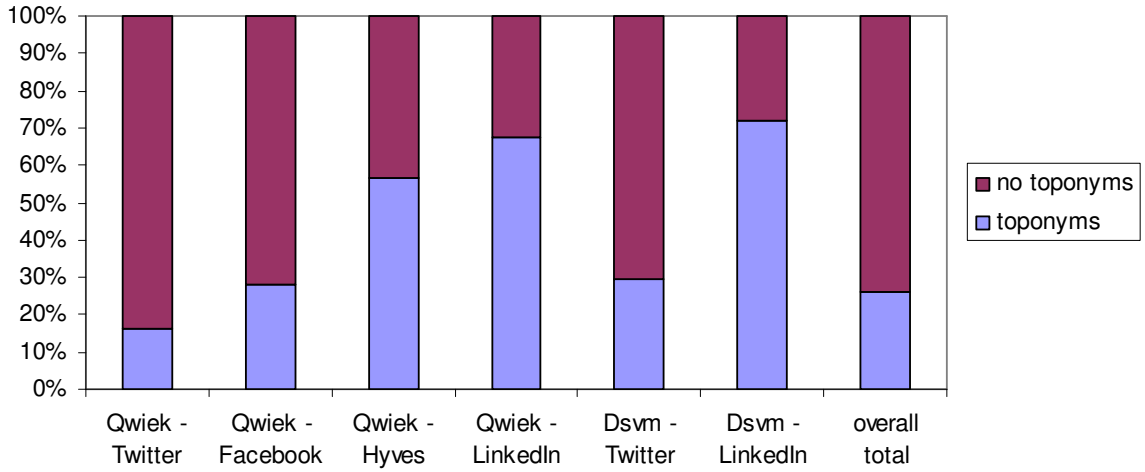

Figure 7: Percentages of messages with and without toponyms

Hyves and LinkedIn messages relatively contain more toponyms than Twitter and Facebook messages. Discussions in these social media are more focused on locations and areas, whereas Twitter and Facebook are used more for messages about the participation projects and related events, and discussions that aren't location based.
Overall, just over a quarter of the messages contains one or more toponyms.

Table 5 shows the number of unique toponyms per social media source and participation project, and the number of messages with toponyms from table 4 for comparison. For Twitter, the number of toponyms written as a hashtag (# followed by a keyword) is

mentioned as they are a keyword feature typical for this channel. The number of messages and unique toponyms are also depicted in figure 8.

Table 5: Number of unique toponyms and number of messages with toponyms

Project	Social media source	Unique toponyms	Messages
Qwiek	Twitter Facebook Hyves LinkedIn	89 (16 with #) 64 13 56	289 96 13 58
De stad van morgen (Dsvm)	Twitter LinkedIn	180 (12 with #) 94	677 71

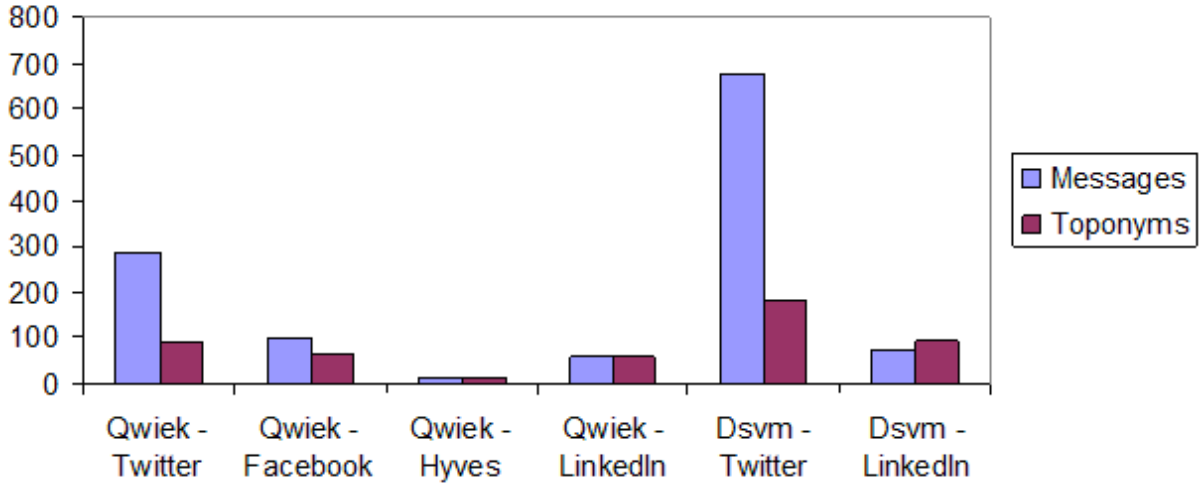

Figure 8: Number of messages with toponyms and number of unique toponyms

The numbers and graph show the more messages are written, the higher the number of unique toponyms is. Discussion doesn't stay focused on a limited set of locations when it progresses or expands. And although they're an important phenomenon of Twitter, hashtags haven't been used much in the participation projects.

5.1.2 Toponym usage – semantics and scale

Tables 6, 7 and 8 show the ten most used toponyms for each social media channel for both projects, ranked by count. The tables also include the type of location from the geographic ontology as defined in table 2, representing the scale of the location.

Table 6: Top 10 for Qwiek Facebook and Hyves toponyms

Toponym	Count	Type		Toponym	Count	Type
Nieuwerkerk	33	populated place		Zuidplas	6	municipality
Zuidplas	25	municipality		Rotterdam	2	populated place
Moordrecht	17	populated place		de terp	2	section
Moerkapelle	14	populated place		Hoofdweg	2	road
het dorp	14	populated place		nesselande	1	section
Gouda	12	populated place		zevenhuizen	1	populated place
Zevenhuizen	10	populated place		nwk	1	populated place
Rotterdam	10	populated place		zmeer	1	populated place
A20	6	road		Bergschenhoek	1	populated place
Alexandrium	6	mall		7huizen plas	1	lake

Table 7: Top 10 for Qwiek LinkedIn and Twitter toponyms

Toponym	Count	Type		Toponym	Count	Type
Nieuwerkerk	23	populated place		#zuidplas	59	municipality
Zuidplas	21	municipality		Zuidplas	47	municipality
Moordrecht	19	populated place		Moordrecht	18	populated place
Gouda	14	populated place		#moordrecht	17	populated place
de dorpen	9	populated place		Nieuwerkerk	15	populated place
Zevenhuizen	9	populated place		Zevenhuizen	13	populated place
A20	6	road		IJsselpad	12	path
Moerkapelle	5	populated place		Moerkapelle	11	populated place
N219	5	road		Ons Dorp	9	building
Nesselande	5	section		La Baraque	7	building

Table 8: Top 10 for De stad van Morgen LinkedIn and Twitter toponyms

Toponym	n	type		Toponym	n	Type
Alphen	67	populated place		Alphen	303	populated place
Alphen aan den Rijn	12	municipality		#alphen	36	populated place
het centrum	9	section		centrum	35	section
Rijn	9	river		Gnephoek	32	polder
de stad	8	populated place		Alphen aan den Rijn	31	municipality
Gnephoek	7	polder		stadhuis	29	building
Lage Zijde	6	section		de stad	28	populated place
Rotterdam	5	populated place		Rondweg	27	road
N207	5	road		Alphen a/d Rijn	23	municipality
Leiden	5	populated place		Groene Hart	22	region

The names of the municipalities and their populated places are the most used toponyms. For the Qwiek project, other important locations are the nearby cities of Gouda and Rotterdam, and sections of the latter, and the main infrastructure.

For the De stad van morgen project, a number of locations in the municipality is often mentioned: the city centre, the river Rijn, the Gnephoek polder, the Lage Zijde central area and a proposed road by-pass (rondweg). Also, the (distant) cities of Rotterdam and Leiden are deemed important, as is the surrounding Green Heart region.

All of these, the populated places, infrastructures and major areas are relatively large scale locations or areas.

In both Twitter data sets one or more buildings are often mentioned. These, as will be seen when analyzing the content of the messages, are actually venues related to the participation projects and not subject of discussion. And the IJsselpad is a new hiking trail of which the opening has been advertised often during a short period.

Looking at the toponyms some more, hashtags don't appear much in the top 10 for the Twitter toponyms. Not only do they form only a small share of the number of unique toponyms, they aren't used much either. Neither are very shortened versions of toponyms. They're only used once or twice per populated place, e.g. n'kerk for Nieuwerkerk. There are more alternative occurrences in Alphen's case: the local telephone area code 0172 is used 19 times as a toponym (both with and without a #), and the municipality's name is shortened to aadr or #aadr 20 times. Most of the toponyms are traditional ones.

5.1.3 Toponym usage – temporal development

Timeline graphs have been made for the numbers of Twitter messages with toponyms per month. These graphs are shown in figures 9 and 10.

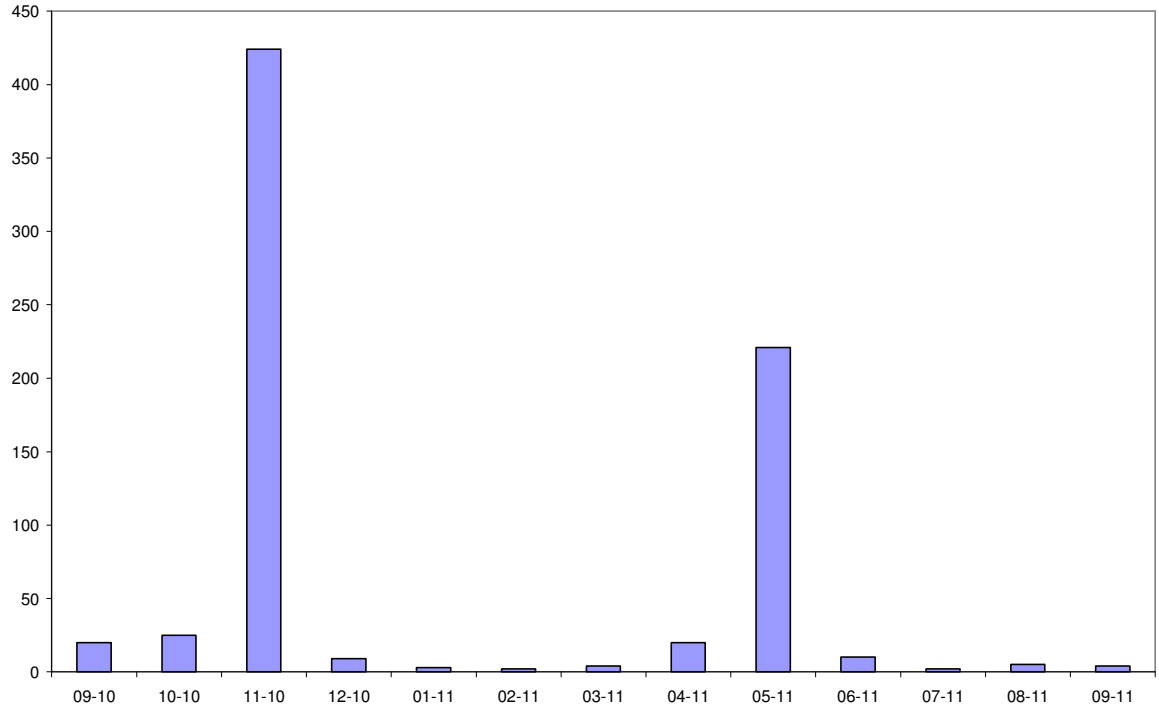

Figure 9: Messages with toponyms per month for De stad van morgen

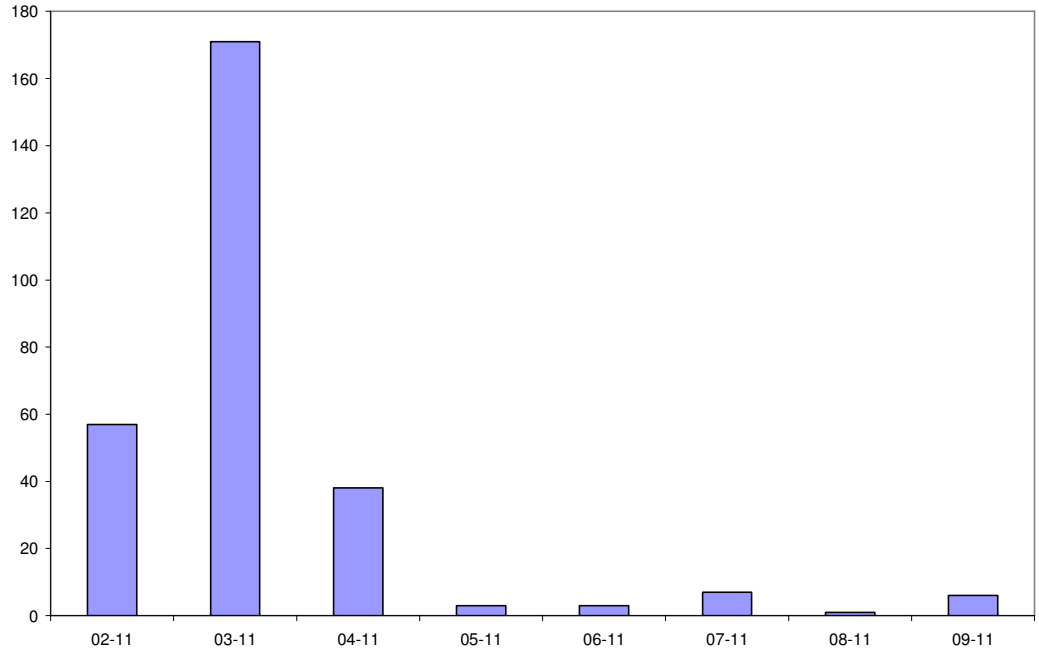

Figure 10: Messages with toponyms per month for Qwiek

The graphs show there are almost only occurrences during the events organized in the participation project, or in their wake. Because of this, information on development of toponym usage through time during the whole participation process can't be established.

Therefore, a focus is made on the days on which the participation events took place, and the most popular toponyms. The latter are chosen because with a high number of occurrences there's a bigger chance of spotting a development trend.
Timeline graphs have been made for a selection of the most used toponyms as shown in tables 7 and 8. These graphs are shown in figures 11 and 12, displaying for each consecutive participation event day the number of mentions. In figure 11, the number is also shown for the municipal council comity meeting (C) which took place half a year later in Alphen aan den Rijn.

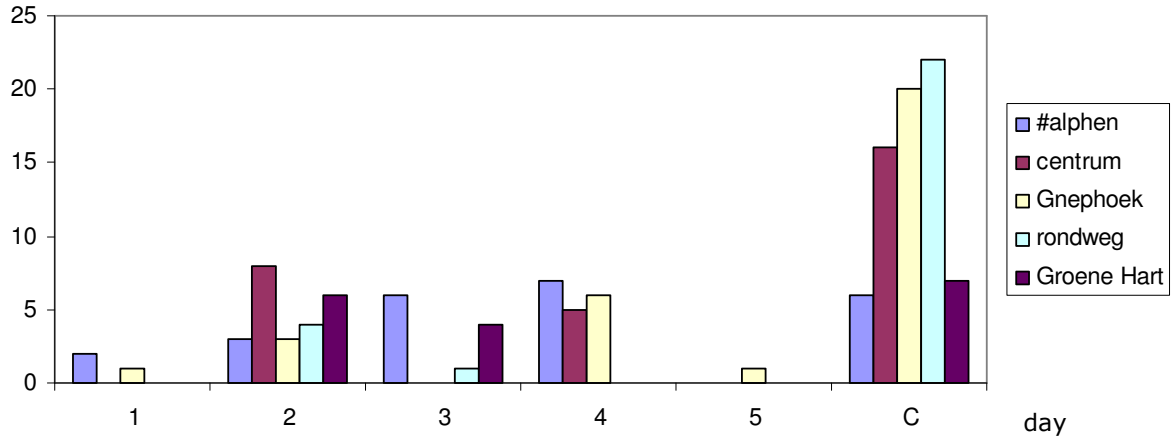

Figure 11: Usage count of popular toponyms per day for De stad van morgen

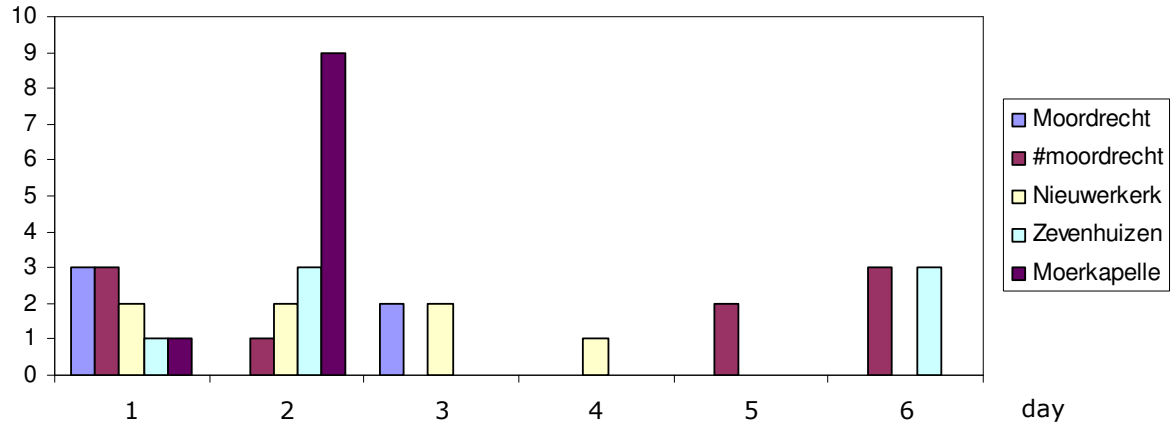

Figure 12: Usage count of popular toponyms per day for Qwiek

Both graphs show there isn't much activity even for the popular toponyms during the participation weeks, hardly any on some days. One exception is 'Moerkapelle' on the second day, because a number of events took place in this village at the time.

On the day of the Alphen municipal council commission meeting however, there's much activity. Especially for those locations or subjects which would be deemed controversial in any participatory spatial planning process: a new by-pass road (rondweg) and urbanisation of a rural area (Gnephoek). This is the only development in toponym usage that can be deducted from the usage data.

5.2 Location based information

The results of tagging the messages and counting the tags are displayed in table 9 and figure 13.

Table 9: Number of content tags per project and social media source

Project	Qwiek				De stad van morgen (Dsvm)		total
Social media	Twitter	Facebook	Hyves	LinkedIn	Twitter	LinkedIn	
fact	13	54	6	28	39	13	153
question	29	17	3	7	82	18	156
opinion	18	53	8	39	130	38	286
idea	6	11	0	8	135	26	186
event	194	12	1	0	349	1	557
report	5	0	2	3	114	4	128
total	265	147	20	85	849	100	1466

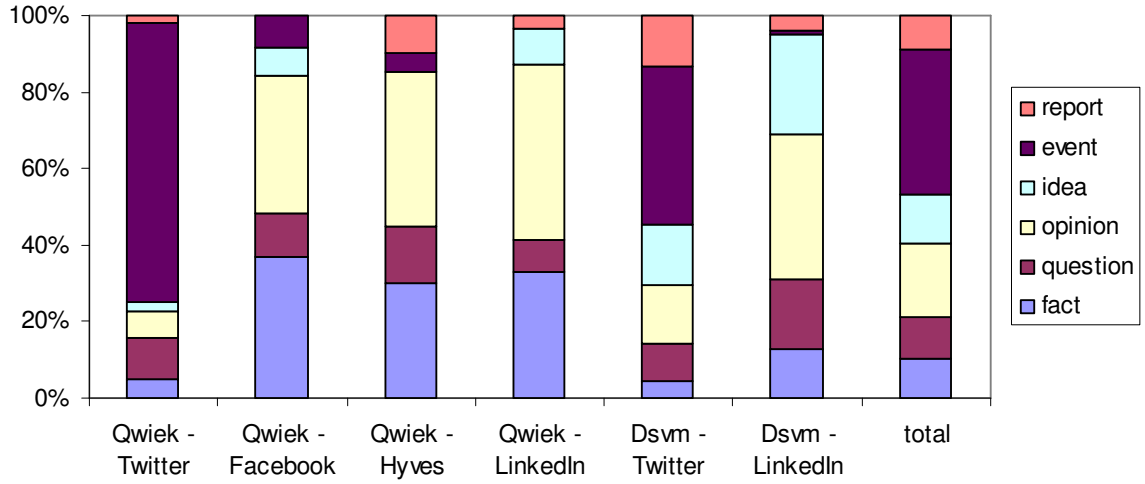

Figure 13: Shares of content tags

In the Qwiek project, Twitter is mainly (73%) used for messages about events, mostly related to the project itself. These are announcements of participation meetings in venues around the municipality. In 25% of the messages information about locations and areas is shared or requested. The other social media are used much more for this, with large shares for messages containing facts and/or opinions (70-79%). This isn't a surprise, as these media are used explicitly by the project organisers to spark discussions.

For the De stad van morgen project, the result is different from Qwiek in two ways. Firstly, Twitter is used significantly less for event related messages (41%) so more actual discussion and participation has been happening there. Secondly, the share of messages containing ideas for (spatial) development of the municipality is much larger (16-26% opposed to 2-9%).

17,9% of the messages containing one or more toponyms have a double tag. A significant share of the messages contain different types of location based information. This is also seen when considering individual social media, with the exception of Twitter in the Qwiek project which mostly broadcasts about events.

Overall, in just over a half of the messages information about locations that contributes to the development of a structural vision is shared. The rest of the messages is related to the participation event.

Social network services Facebook, Hyves and LinkedIn lend themselves best for discussing spatial development as structured discussions can take place here. The use of microblogging services like Twitter depends on how it is applied: for broadcasting about events only or also e.g. for public discussions during a municipal council meeting.

5.3 Information sharers

For Twitter, statistical information about users and usage from the Twapperkeeper archives and other sources is displayed in table 10.

Table 10: Twitter user and usage statistics

	Qwiek	De stad van morgen
Share of users that posted 80% of messages	12%	13%
Share of tweets posted by top 10 of users	73%	47%
Users that posted once	49%	62%
Total number of twitter users	132	298
Inhabitants >15 years (2011, CBS)	32808	59286
Active Twitter users (estimated)	656	1186

In both projects, a small fraction of the municipality's adult inhabitants is participating on Twitter, although they represent one fifth to a quarter of the estimated number of active Twitter users. And out of this fraction, it's a small share of people that is taking part in most of the conversation. A much larger share has only contributed once, and has probably not been participating in discussions.

The top ten of Twitter users for the Qwiek project consists of the project organizer, seven civilians, the mayor and the local web community representative. The top ten conversations are between these people and three other civilians.
For De stad van morgen the top ten consists of the organizer, six civilians, the project leader (appears twice) and a municipal council member. The top ten conversations are between these people, one local journalist, one municipal employee and a municipal council member.

In the Qwiek project, most interaction takes place between the organizer and the public. In the other project, the public seems less involved as there is a large share of the top ten users that is working for the municipality, but only half of the conversation is conducted by these users.

After a manual count, statistics like those from Twapperkeeper can be made for the discussions in the LinkedIn groups of the two projects. These are shown in table 11.

Table 11: User and usage statistics of LinkedIn groups

	Qwiek	De stad van morgen
Share of active members that posted 80% of messages	32%	47%
Share of comments posted by top 10 of active members	91%	66%
Active members that posted once	42%	53%
Number of active members	19	34
Total number of members (per 21-10-2011)	45	215
Inhabitants > 15 years (2011, CBS)	32808	59286
LinkedIn users (estimated)	4134	7470

The number of people who are a member of the LinkedIn groups is very low compared to the number of adolescent and adult inhabitants, and even to the estimated number of

LinkedIn users in the municipalities. Also, a large share of the group members is not actively participating. The people who are active are quite dedicated to the discussions, especially when compared to the statistics from Twitter which involves more casual participants.

The top ten of active members for the Qwiek project consists of the organizer and nine civilians. For De stad van morgen, the top ten consists of the organizer, the project leader and 8 civilians. Most of the discussion takes place between the civilians, the organizer starts them and hardly takes part during the discussion.

There's an overlap between the groups of most active Twitter users and LinkedIn members, as a large number of people participates in both channels.

Overall, on Twitter the conversation is centred on the participation project's organisation and doesn't involve much discussion among the public. In social network services, such discussion is present as soon as it's sparked by the municipality using statements.

5.4 Assessment of added value

The three key performance indicators for public participation through social media have been defined as the number of occurrences and the scale of toponyms, the type of location based information that has been shared and the number and nature of information sharers.
The added value has been defined as involving more people in public participation at a higher level, while the information being shared is relevant to the spatial plan.

Messages and discussions in social media are mostly about relatively large geographic areas, and do not focus on small locations and/or details much. This relates strongly to the scale of the spatial plan, as a structural vision is made for the whole municipal area and does not have much detail. The information shared therefore contributes to the spatial plan development.

The participants in the Zuidplas project are mainly sharing facts and opinions about the current situation in their surroundings. They are at the level of consultation. In the Alphen project a significant number of people is also saying how they think it could be changed. This puts them at the desired level of co-production on Edelenbos and Munnikhof's participation ladder. The added value differs here, but it shows the use of social media as communication channels enables the public to be higher on the ladder.

Few inhabitants of the municipalities are participating using social media. And even less are doing this exclusively. In Alphen aan den Rijn, civil servants and council members are notably involved, in Zuidplas much less.
There doesn't seem to be much added value here, although one can argue anyone participating through social media is a gain above those participating in traditional ways. A reason for the lack of involvement by the public could be the way in which the participation projects have been prepared and announced, which was unclear according to several people.

Overall, this shows the information is relevant for the spatial plan, it includes ideas and suggestions for spatial development and it shared by people who do not use other channels. The use of social media for public participation does enhance participation in the spatial planning process, or at least shows much potential. Although not many more people are getting involved in creating spatial plans, they are providing constructive contributions to the plan creation, moving them to or placing them on a higher level on the participation ladder.

6 Conclusions and recommendations

The objectives of this research were to analyse in which way geographical and other information regarding spatial plans are shared through social media, and to assess whether this enhances participation in the planning process.
The assessment showed the information sharing indeed has added value to the participation, involving more people who are co-producing the structural visions.
Because participatory planning projects such as researched are examples of a possible social media PPGIS, conclusions are made here regarding the sharing of geographical information. This is partly done with the retrieval of such information in mind. Also, the results are discussed and validated. Finally, some recommendations towards further research into social media, participatory planning and geographical information are made.

6.1 Conclusions

Geographical information that is relevant to the spatial plan is mostly shared when discussions in social media are triggered by the organizers of the spatial planning process, asking for input on certain themes. Spontaneous input is occurring less, and mostly on Twitter. A large part of messages are used to discuss locations related to the process and events. These are not relevant to the plan and need to be filtered, using the context of the toponyms.

As discussion expands, more variety in toponym usage occurs. People don't stay focussed on a limited set of locations and use more alternative names to refer to locations. This does make discussions on Twitter harder to trace as unambiguous connections between the alternative names have to be made. The alternative names also pose challenges regarding reliably capturing the toponyms. But as the majority of the messages contains a limited set of toponyms which are easily georeferenced as they are of a traditional nature, most of the discussion is easily traced.

Given the informal nature of social media, and in Twitter's case the limited text space, it's remarkable to actually see people tend to use the traditional full or colloquial toponyms rather than abbreviations and informal alternatives such as telephone area codes. On Twitter this leaves less room for the actual content about the location, but users easily circumvent this by using more than one message to share their information.

Discussion about locations hardly occurs outside of event time frames. This is dependent on the way the participation has been organized, which makes the discussion event driven. Because of this, there is not much opportunity for toponym usage to evolve over time, as opposed to over volume.
Again, this has its advantage regarding reliably and easily capturing and georeferencing information about locations relevant to the spatial plan. And because most of the sharing is done within a short span of time, efforts to capture the information can be limited to the event time frames without running the risk of missing a significant part.

Overall, geographical information regarding spatial plans is shared through social media by a small, dedicated group of people on an event driven basis, using mostly traditional toponyms to refer to locations that are relevant to the spatial plan.
These characteristics, which are quite similar to those of traditional planning, can be used when developing a participatory planning GIS that incorporates social media channels.

6.2 Discussion of results

6.2.1 Potential influences on results

While executing the research, some issues were encountered that sometimes called for decisions. These issues and decisions have a potential impact on the results and conclusions, and are therefore mentioned.

Regarding the number of Twitter messages for the 'De stad van morgen' project it should be noted that in several messages a number of "11547 tweets" created during the first week of November 2010 is mentioned. The messages acquired from the Twapperkeeper archives and the workshop Twitter accounts is therefore a fraction of the total volume (at most 20%). This is due to the nature of the Twitter application, which does not provide full public access to all messages ever posted. The consequence is that this research does not provide a full picture. The Twitter data sample may not be representative of the participation that has been happening in this project.

While extracting the messages with one or more toponyms from the research data, an issue of ambiguity have been encountered. A toponym can be a part of the name of an organisation or of an URL. This is especially the case for the names of the municipalities (Alphen [aan den Rijn] and Zuidplas). Messages containing only these 'false toponyms' have been excluded from the research data as they do not relate to a location.

While determining the type of location according to the geographic ontology defined earlier, another issue of ambiguity was encountered. The toponyms Alphen aan den Rijn and the colloquial variant Alphen can relate to either of two entities in the geographic ontology: the municipality and the populated place. From the immediate context, i.e. the rest of the message, the intended meaning had to be derived. The rule of majority has then been used to appoint a location type to these toponyms.

The number of potential participants using Twitter couldn't be reliably established as there are no unambiguous statistics available regarding the number of Twitter users relative to the total population.

Except for the limited amount of Twitter messages and the possibly non-representative data sample, these issues do not have a significant impact on the results and conclusions

6.2.2 Validation for Qwiek

The municipality of Zuidplas (2011) has published a report with an evaluation and results of the participation week. It contains some statistics on virtual participation that can be matched to the results of this research to evaluate its reliability. This is done in table 12 by listing the number of messages.

The municipality reports much more Facebook messages, and much less for Twitter. The reason for the first difference is the presence of many non-textual messages on Facebook which have been neglected in this research. The cause for the different numbers of Twitter messages is unknown, but this is not an issue as this research covers 300 more messages and therefore extra information.

Table 12: Number of messages per social media channel

Social media	Research sample	Zuidplas report
Twitter	1752	about 1450
Facebook	343	about 650
Hyves	23	?
LinkedIn	86	about 80

The report states the development of a vision on the term 'vital village' lends itself well for citizen participation, or to be more precise citizen consultation. Considering this term, the municipality didn't seem to aim very high on the participation ladder. The results of this research show the level of participation has been what was expected: mainly opinions and facts have been shared but not many ideas or suggestions (table 9 and figure 13).

The report also mentions quantitatively good results, although objectives haven't been defined because of a lack of reliable comparison material. A longer and more intensive campaign period could most probably have improved involvement as many people have missed the announcements about the participation week. This matches with some of the messages citizens have posted about the lack of involvement by the public.

No comments are made about the locations that have been discussed, the report only considers thematic subjects.

6.2.3 Validation for De stad van morgen

The municipality of Alphen aan den Rijn hasn't published such a report, so a short questionnaire featuring the four research sub-questions has been sent to the project leader for the structural vision (see appendix B). The answers plus a presentation being used to tell other organisations about the participation week are used to validate the research results for De stad van morgen.

As the presentation contains some statistics on virtual participation, these can be matched to the results of this research to evaluate its reliability. This is done in table 13 by listing the number of messages.

Table 13: Number of messages per social media channel

Social media	Research sample	Presentation
Twitter	2285	about 11000
LinkedIn	99	about 60

The obvious difference is in the number of Twitter messages, this has already been noted in the discussion of the results as the higher number vs. the research sample has been mentioned in some messages themselves.

The answer regarding the locations being discussed mentions there wasn't one subject or area that rose head and shoulders above the rest. Indeed, the results of the analysis of toponym usage (table 8) don't show one specific toponym being used much more than the others ('Alphen' isn't considered to be a specific area or subject as it refers to the whole municipality or town). But there are some toponyms though that as a group do show importance.

The type of information being shared is deemed to be very divers, ranging from simple questions to expressing views, responding to statements and telling stories. This answer doesn't explicitly mention the large share of ideas being shared according to the results of this research (table 9 and figure 13), which is important for a high participation level.

All kinds of people have participated, citizens, entrepreneurs and civil servants. The latter had the roles of providing answers and being conversation partners. The involvement of entrepreneurs or companies doesn't show from the research results, they have been classified as citizens as well.

According to the municipality, the added value of the information shared via social media is the large number of people thinking along with the planners. This also worked positive

towards the council. There has hardly been any discussion about the product of the participation week, as the members of the council have seen for themselves what has been said and asked by the citizens.

This complies with Healey (1998a) stating good public participation means there is collaboration in spatial policymaking. Formal politics mingles with different kinds of groups from society, citizens, businesses and environmental and (other) pressure groups, to develop a spatial strategy. When those with power consider the concerns of all other stakeholders (1998b) and include them in a respectful way, also those without voice are involved.
Healey (1998b) further identifies collective reasoning through collaborative processes, which is also what has been happening here as the council accepts and adopts the outcome of the participation week as reasonable and legitimate.

Also, the speed of social media was a plus. Because participants received a response quickly, they stayed involved and interested. Because of this, all of the information needed for the structural vision (analysis of the city, strengths and weaknesses, opportunities) have been gathered within one week.

6.3 Recommendations for further research

6.3.1 Methodology

In this research, only the Twitter messages from specific accounts and/or with designated tags have been used as research data. A more encompassing view on the conversation would be acquired when other key words are used to search and retrieve relevant messages. This way, non-event based discussion could be captured. This type of discussion is even more valuable, as peaks in Twitter message generation can't be captured very well. As has been seen in the case of the 'Week of the structural vision' in Alphen aan den Rijn, only a minor part of the messages can be retrieved during an event where many people are engaged. Message capturing can best be done during the planning and participation process, as getting live data is easier than gathering it afterwards.

The case studies that have been done in this research regard large scale spatial plans for the whole municipality. Another worthwhile approach would be to study a more specific and possibly controversial spatial plan such as new infrastructure proposed in an area. Such plans are known to cause a lot of conversation and (not in my backyard) sentiment.

6.3.2 Visualisation of toponyms

Toponym usage data acquired from research such as this can be used to create maps that give more insight into which locations are being discussed regarding spatial plans. This would enhance the social media driven PPGIS that has been described earlier on, visualizing the conversation.

As an example, a map has been derived manually from the top ten of toponym usage on LinkedIn in the Qwiek project. This has been done using a font size relative to the usage of a toponym (figure 14), visualising the importance of locations in the participation project. For areal locations, the toponym is placed at the centre point. If a toponym references multiple locations ('de dorpen', meaning the villages), it's placed at the approximate centre point of the collection. Linear objects (i.e. roads) are referenced using multiple toponym occurrences along the object.

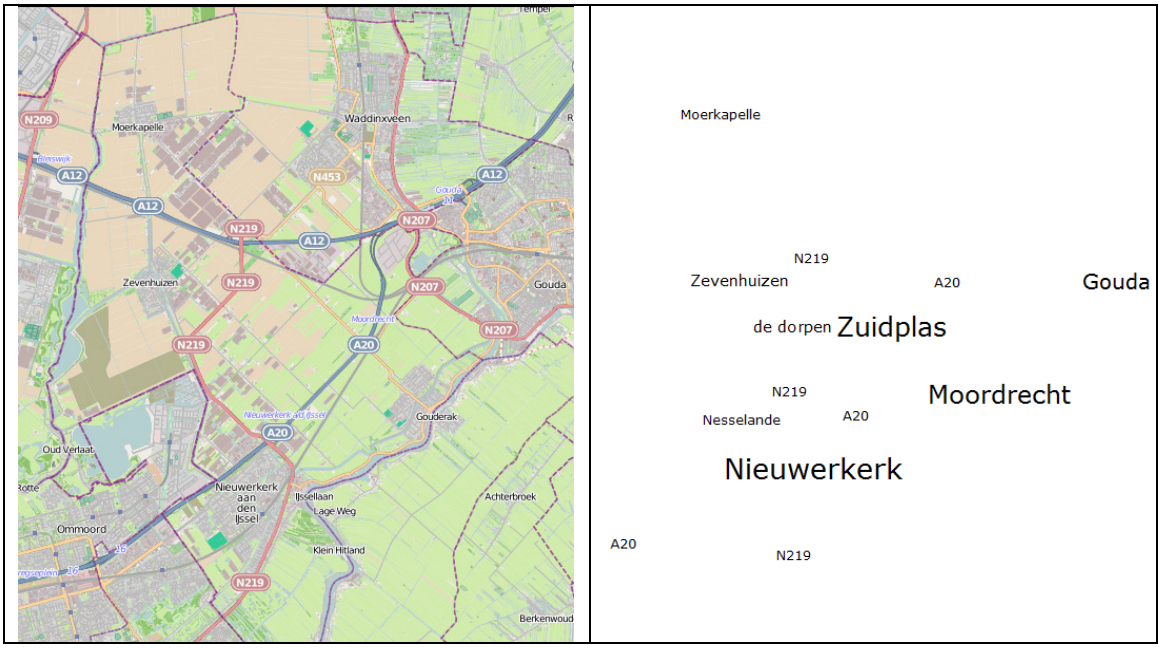

Figure 14: OpenStreetMap (left) and mapped toponym usage in LinkedIn for Qwiek

Such maps could theoretically also be created automatically as has been done in the World Explorer project by Ahern et al. (2007) and the Maple project by Hahmann and Burghardt (2011). Deriving and georeferencing toponyms from social media will pose serious challenges though because of their informal nature. This is proven by the lists of toponyms created in this research (see appendix C), which only partly match a database such as Geonames. The usage of official and well-known colloquial toponyms is quite high though, so a large share of the toponyms could be derived and referenced automatically.
Once the toponyms have been georeferenced successfully, the views and other input regarding the locations can also be displayed on the map.

6.4 Final words

Taking on the subject of the apparent new generation of PPGIS in which social media and especially social networks and microblogging play a big role, this research has shown there's a great potential and reward for developing such geographical information systems.

The tools are all available already: capturing messages, georeferencing them, displaying them on a map on a website, using tag clouds for representation of major and minor issues. And although there are also challenges such as described, it is worthwhile to take this road and to try and see whether this type of PPGIS will deliver all the promises made in the past.

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Appendix A: data sources

De stad van morgen
http://www.twapperkeeper.com/person/morgenisvanjou
http://www.twapperkeeper.com/hashtag/dsvm
http://www.twitter.com/atelierkwali
http://www.twitter.com/ateliercompact
http://www.twitter.com/atelierboeiend
http://www.linkedin.com/groups?gid=3518209

Qwiek
http://www.twapperkeeper.com/hashtag/qwiek
http://www.linkedin.com/groups?gid=3776081
http://www.facebook.com/qwiek
http://qwiek.hyves.nl

Appendix B: Interview

The four research sub-questions were posed to and answered by P. Commissaris, the project leader of the structural vision for Alphen aan den Rijn.

Q: Over welke locaties en gebieden is met name gesproken gedurende de participatie, op welke ruimtelijke schaalniveaus?

A: In dit geval hebben we participatie primair via social media laten verlopen. De structuurvisie beslaat het hele grondgebied van de gemeente Alphen aan den Rijn. De participatie was heel breed. Om je een indruk te geven: in 5 weken hebben we 11.000 tweets ontvangen die betrekking hadden op de stad van morgen. Er was niet 1 onderwerp of gebied dat er met kop en schouders bovenuit stak, over letterlijk alles werd gecommuniceerd. Komt ook omdat wij een 7-tal ateliers hadden benoemd met verschillende thema's, die alle aspecten van de stad omvatten. Dan moet je denken aan thema's als "werken en economie", "boeiend wonen", "relatie stad-groene hart" etc.

Q: Wat is er over deze locaties gezegd, wat voor soort informatie is er gedeeld?

A: Met name twitter bleek een hele lage drempel te zijn qua participatiemiddel (we hebben daarnaast LinkedIn, Hyves, Facebook en www.destadvanmorgen.nl ingezet). Het soort informatie dat werd gedeeld was zeer divers: van eenvoudige vragen aan een atelier, tot het uiten van standpunten. Op LinkedIn werd gereageerd op stellingen, en werden (waardevolle) bijdragen geleverd in de vorm van korte verhaaltjes.

Q: Wie hebben er over gesproken, hoeveel mensen in welke rol (burger, ambtenaar of anders)?

A: Als je bedoelt wie hebben geparticipeerd, dan is het antwoord ook weer: heel breed. Zowel bedrijven als bewoners participeerden. Vanuit het project vervulden ambtenaren de rol van "antwoordgevers" en "gesprekspartner".

Q: Wat is de toegevoegde waarde geweest voor de totstandkoming van de structuurvisie?

A: uit het aantal tweets en de reacties op de andere social media blijkt dat een groot aantal mensen heeft meegedacht. Dat is op zich al een toegevoegde waarde. Ook richting gemeenteraad wierp dat zijn vruchten af: in de raad was nauwelijks discussie over het product, omdat ze zelf hadden kunnen zien welke opmerkingen werden gemaakt en vragen werden gesteld. De snelheid van social media was ook een pluspunt: doordat

insprekers onmiddellijk antwoord kregen op hun vraag of reactie op hun opmerking, bleven ze aangehaakt en geïnteresseerd. De bouwstenen voor het resultaat (analyse van de stad, sterke en zwakke kanten en kansen voor de toekomst) zijn daardoor ook binnen 1 week verkregen. Daarnaast: goede reclame voor de gemeente: ik heb dankzij de innovatieve aanpak een keer of 20 een verhaal mogen vertellen over onze aanpak bij gemeenten, bedrijven en instellingen. Alphen op de socialmediakaart.

Je kunt ook nog even kijken naar http://prezi.com/sdc6x3_kut5o/structuurvisie-en-social-media/

Appendix C: toponym lists

De stad van morgen – Twitter

	n		n		n		n
Alphen	303	A3	4	Oude Rijnzone	2	Heemstede	1
#alphen	36	Deventer	4	Raadhuisstraat	2	horecastraat	1
centrum	35	Eisenhowerlaan	4	Randstad	2	H'woude	1
Gnephoek	32	Leusden	4	zaanstad	2	Jawi	1
Alphen aan den Rijn	31	Rotterdam	4	groen hart	1	K'kerk	1
stadhuis	29	Thialf	4	010	1	koudekerk	1
de stad	28	treinweg	4	020	1	La Rambla	1
Rondweg	27	#groenehart	3	030	1	Limeshal	1
Alphen a/d Rijn	23	#thcastellum	3	1504	1	Molen	1
Castellum	23	appel	3	#barista	1	N11-Bodegraven	1
Groene Hart	22	estland	3	#K&Z	1	N209	1
#dsvm	20	gouda	3	#muziekgebouwaantij	1	nieuwkoop	1
N207	15	hefbrug	3	#ORZ	1	NL	1
Oude Rijn	14	Kerk en Zanen	3	@allehens	1	Noord-Korea	1
0172	13	Lage Zijde	3	@AlleHensAanDek	1	NY	1
Rijnplein	13	parktheater	3	@jawi_sport	1	oeverzone	1
aadr	12	Rijplein	3	@Wijnbarvinecole	1	ooskanaal	1
Baronie	11	stadshart	3	A	1	Oostkanaalweg	1
Boskoop	11	#Gijn& Rouwe	2	aangewezen inbreidingslocaties	1	OR-zone	1
Rijnhaven	11	3e centrumbrug	2	Alphen-Noord	1	Palazzogebouw	1
#aadr	8	Aarlanderveen	2	Arena	1	randen huidige wooncontour	1
bypass	8	alle hens	2	autoboulevard	1	r'dam	1
hier	8	Alphenadrijn	2	A'veen	1	Rijn Gouwelijn	1
Zegerplas	8	Amersfoort	2	Avifauna	1	RijnhavenOost	1
theater	8	Amsterdam	2	azie	1	Rijnstreekhal	1
A4	7	Archeon	2	België	1	ringweg	1
Bospark	7	Barca	2	Bilbao	1	rondtunnel	1
Davinci	7	barista	2	B'koop	1	Rotterdamse Rijnhaven	1
gemeentehuis	7	binnenstad	2	burgemeester Visserpark	1	schiphol	1
Rijn	7	de stad van morgen	2	bypass, water	1	Spanje	1
Rijnwoude	7	Den Haag	2	Danny Au	1	stationsgebied	1
station	7	Dld	2	De Grote Eik	1	stationsomgeving	1
#0172	6	glazen huis	2	de stad van nu	1	t Geveltje	1
@thcastellum	6	groenehart	2	deze stad	1	Tel.com toren	1
Leiden	6	grote rondweg	2	DH	1	Thorbeckeplein	1
N11	6	Herenhof	2	die veenplas	1	UK	1
GH	5	het plein	2	Dolce vita	1	USA	1
het dorp	5	Kerk & Zanen	2	driebergen	1	Van Manderloostraat	1
jaagpad	5	Kerk&Z	2	fietsappel	1	Venetië	1
Maximabrug	5	Kunstverdieping	2	Fossapad	1	vin ecole	1
Park Rijnstroom	5	molengang	2	gemeentegrenzen	1	Voorschoten	1
Utrecht	5	Omloopkanaal	2	groene hart van alphen	1	wageningen	1
A.	4	oostkanaal	2	grote bypass	1	Z'dam	1
#alphenaandenrijn	4	OR	2	Haarlem	1	Zoetermeer	1
A12	4	OTA	2	Hasselt	1	Zwammerdam	1

De stad van morgen - LinkedIn

	n		n
Alphen	67	rondweg	1
Alphen aan den Rijn	12	Oudshoorn	1
het centrum	9	Ridderveld	1
Rijn	9	Zegersloot	1
de stad	8	Steekterpolder	1
Gnephoek	7	Rietveld	1
Lage Zijde	6	Rijnwoude	1
Rotterdam	5	Bodegraven	1
N207	5	Randstad	1
Leiden	5	grote by-pass	1
Oude Rijn	5	Bio Science Park	1
het dorp	4	A11	1
Groene Hart	4	Ring	1
Kerk en Zanen	4	westkant	1
station	3	Eisenhouwerlaan	1
Utrecht	3	Prins Bernard laan	1
Groen Hart	2	fiets appel	1
N11	3	Nederland	1
oud centrum	2	Alphen a/d Rijn	1
OTA	2	Heempark	1
Aarlanderveen	2	Thorbeckeplein	1
Zwammerdam	2	Burgemeester Visserpark	1
Nieuwe Sloot	2	Westkanaalweg	1
Hoorn	2	stadshart	1
Hoge Zijde	2	Archeon	1
Amsterdam	2	grote bypass	1
A4	2	water-bypass	1
A12	2	Oudshoornseweg	1
De Verbinding	2	het ziekenhuis	1
de parkeergarage	2	Alphen om de Rijn	1
kleine bypass	2	Oudhoonseweg	1
hefbrug	2	Julianabrug	1
Den Haag	1	Juliania brug	1
argentinie	1	Oudhoornse weg	1
Maasboulevard	1	Oudshoornse kerk	1
NS station	1	Venetië	1
PTT toren	1	Kromme Aar	1
oude centrum	1	fontein in het park	1
oud centrum aan den Rijn	1	Aarkade	1
Leimuiden	1	hooftstraat	1
Middelburg	1	nieuwe stadhuis	1
Naarden	1	oude kastanje	1
Amersfoort	1	Alphense brug	1
Polder Vrouwgeest	1	het theater	1
Baronie	1	stationplein	1
Almere	1	N11-aansluitingen	1
grote rondweg	1	de spoorwegovergang	1

Qwiek – Twitter

	n		n
#zuidplas	59	Nieuwerkerk a/d Ijssel	1
Zuidplas	47	Dorpskerk	1
Moordrecht	18	#alphen	1
#moordrecht	17	Groene Hart	1
Nieuwerkerk	15	ZPL	1
Zevenhuizen	13	#India	1
IJsselpad	12	Gouwe Park	1
Moerkapelle	11	New York	1
Ons Dorp	9	Beth-san	1
La Baraque	7	IJsselthuis	1
Hoofdweg	6	Moerdrecht	1
Op Moer	5	zuIPplas	1
gemeentehuis	5	Groene Hart park	1
Benthuizen	5	wijk Zuidplas	1
Koornmolen	5	oud verlaat	1
#Moerkapelle	4	onze gemeente	1
Zevenster	4	LaBa	1
OpMoer	4	Zuidplasdorp	1
van der valk	4	ringvaart	1
gouda	4	nwk	1
IJssel	3	v/d valk	1
Rotte	3	z'huizen	1
Alphen	3	m'drecht	1
Oud-Verlaat	3	7huizen	1
Waddinxveen	3	de golfbaan	1
Dorpsstraat	2	#nieuwespeeltuin	1
#OpMoer	2	nieuwe speeltuin	1
Hollandse Ijssel	2	Thorbeckeplein	1
Europalaan	2	#warmoezierspad	1
Nkerk	2	het zwembad	1
Batavier	2	zevnehuizen	1
#Tsjechie	2	eigen dorp	1
N'kerk	2	ommoord	1
vd valk	2	regio 010	1
nkerk	2	dorrestein	1
Markt	2	Den Haag	1
meander	2	#gouda	1
#warmoezenierspad	2	aansluiting A20	1
#swanla	2	Laan van Avantgarde	1
swanla	2	station Nieuwerkerk	1
rotonde	2	NS-station	1
#zevenhuizen	2	Kerklaan	1
#nieuwerkerk ad ijssel	1	Korenmolen	1
#nieuwerkerk	1	#labaraque	1
regio Utrecht	1		

Qwiek – LinkedIn

	n		n
Nieuwerkerk	23	Capelle aan den Ijssel	1
Zuidplas	21	Den Haag	1
Moordrecht	19	Dorpsplein	1
Gouda	14	Groot Rotterdam	1
de dorpen	9	het oude dorp	1
Zevenhuizen	9	het plein voor het oude gemeentehuis	1
A20	6	het strand aan de plas	1
Moerkapelle	5	het Westen van Nl	1
N219	5	Nieuwegein	1
Nesselande	5	Nieuwerkerk aan den Ijssel	1
Rotterdam	5	Niewerkerk	1
gemeente Zuidplas	4	Nwkrk station	1
Hoofdweg	4	Raadhuis	1
Nesselanden	4	reigerhof	1
de boom	3	s gravenweg	1
Groenewegbrug	3	Saffier	1
Randstad	3	Schiedam	1
Betuwelijn	2	Spijkenisse	1
de gemeente	2	Station Nieuwerkerk	1
Dorpsstraat	2	t Blok	1
Esse	2	vier dorpen	1
Nwk	2	vierkap	1
oud verlaat	2	W.Berlijn	1
R.Dam	2	Zevenhuizen Moerkapelle	1
raadhuisplein	2	Zevenhuizen/Moerkapelle	1
Utrecht	2	Zevenhuizen-Moerkapelle	1
ZeMo	2	Zuidplas-dorpen	1
a12	1	Zuidplaspolder	1

Qwiek – Hyves

	n
Zuidplas	6
Rotterdam	2
de terp	2
Hoofdweg	2
nesselande	1
zevenhuizen	1
nwk	1
zmeer	1
Bergschenhoek	1
7huizen plas	1
het dorp	1
Laan van Avantgarde	1
Capelle	1

Qwiek – Facebook

	n		n
Nieuwerkerk	33	station	1
Zuidplas	25	station Nieuwerkerk	1
Moordrecht	17	raadhuisplein	1
Moerkapelle	14	Dorrestein	1
het dorp	14	de Esse	1
Gouda	12	Hoogeveenen	1
Zevenhuizen	10	Rotterdam Alexander	1
Rotterdam	10	Capelle Schollevaar	1
A20	6	zevenkamp	1
Alexandrium	6	het speelveldje	1
Nesselande	5	7huizen	1
Hoofdweg	5	Oude dorp	1
Capelle	5	Nieuwerkerk aan den Ijssel	1
Reigerhof	5	nieuwekerk	1
het station	4	ZeMo	1
Kuyperstraat	3	zevnhuizen	1
het winkelcentrum	3	Nwkrk	1
het gemeentehuis	3	Zuidplasdorpen	1
station Gouda	2	het park achter het van der valk hotel	1
Kleine Vink	2	Essepark	1
Eendendaal	2	hitland	1
Swanla	2	alexandruim	1
ommoord	2	het nieuwe winkelcentrum	1
Zuid Holland	2	Oostenrijk	1
Den Haag	2	de bushalte bij het winkelcentrum	1
Voorburg	2	Op Moer	1
Nwk	2	Zespunt	1
Theater Swanla	2	Taverna	1
mijn achtertuin	2	het politiebureau	1
Sterremos	1	Isala	1
Lallemanstraat	1	Groenewegbrug	1
Lallemanstraat of de straat erachter	1	ons rijtje	1