

# An Open Source WebGIS Solution for a Merging Cross-Border Region | A Best Practise Example Eurodistrict Saarmoselle

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## 1 ABSTRACT

Cross-border integration was and still is one key aspects of the EU. It is the focus of this study to show the efforts of a German-French border-region for a better integration and its use of geoweb based services by planners. One of the first projects in their new constitution was to develop a common, cross-border management for the commercial zones. The idea was, to create a technical platform like a portal that contains a coherent raw-dataset with centrally managed geodata and decentralized managed metadata. The homogenising data (same projection mode and the method of collection) is displayed on an “Administration-Portal”. This is only accessible for the communities and they are in force to insert their own data. The strong focus on self-administration should aim for a better acceptance of such a portal and especially the way of working and collaborating. Hence, there will be not a typical top-down-oriented result because every member will be in charge of the quality of their own data and will feel responsible for it. In addition to that, a “Viewer-Portal” with possibility for data-request is developed to inform the population and investors and in a marketing purpose. Management of the commercial zones could be a first step to a more complex portal with all kind of different data that could be used by planners to develop new strategies for up to now unkown problems.

## 2 EURODISTRICT SAARMOSELLE

### 2.1 Studycase Eurodistrict SaarMoselle

The European Union and its integration have a long and eventful history. The transformation from an inhomogeneous accumulation of sovereign states into a more supranational confederation is accompanying with the ambition of more cooperation between the countries. Thus, this is especially remarkable in border areas. One of these regions with an especially eventful and changing history in the last 200 years is the German French border.

The Federal State Saarland as parts of this area even changed its affiliation for eight times (Eurodistrict SaarMoselle, 2008). One of the first remarkable cross-border cooperation projects was the region Saar Lor Lux. This was founded by the state of Luxemburg, the French federal state Lorraine and the German federal state Saarland (subsequently, the Belgium Wallonie and the German Rhineland Palatine joined this administrative construction as well) and was established mostly because of the common economic structure (steel and mining based industries) and their needs for common cooperation. Besides this greater region those issues, the demand for a cooperation unit on a smaller scale arose. Especially the importance of urban areas for the rural development attained more attention. The Charta of Leipzig now as well underlines the importance of this issue in 2007 from the European Union (European Commission, 2007). One of those regions is the German French neighbouring region around the city of Saarbrücken. This agglomeration area of Saarbrücken and its close German communities as well as the bordering French communities count about one million inhabitants (Eurodistrict SaarMoselle, 2008). Especially the spatial proximity and the same economy structure are causing the demand for a high cooperation and integration and on the other hand, the disuse of this special potential. Aim for this area, which is a smaller unit than a EUREGIO, was to establish an Eurodistrict. In the middle of the nineties, the “Verein Zukunft Saar Moselle Avenir” was founded to improve the cooperation and integration in this cross-border agglomeration area. Subsequently in 2010, the Eurodistrict SaarMoselle, an European Cross-Border Cooperation Groupings (Europ. Verbund territorialer Zusammenarbeit/EVTZ) developed from its predecessors. This construction is founded by the European program Interreg IVa and by a yearly member fee of 0,80€ / inhabitant. The following picture clarifies the dimensions with the actual members of the Eurodistrict (blue line) and possible partners.

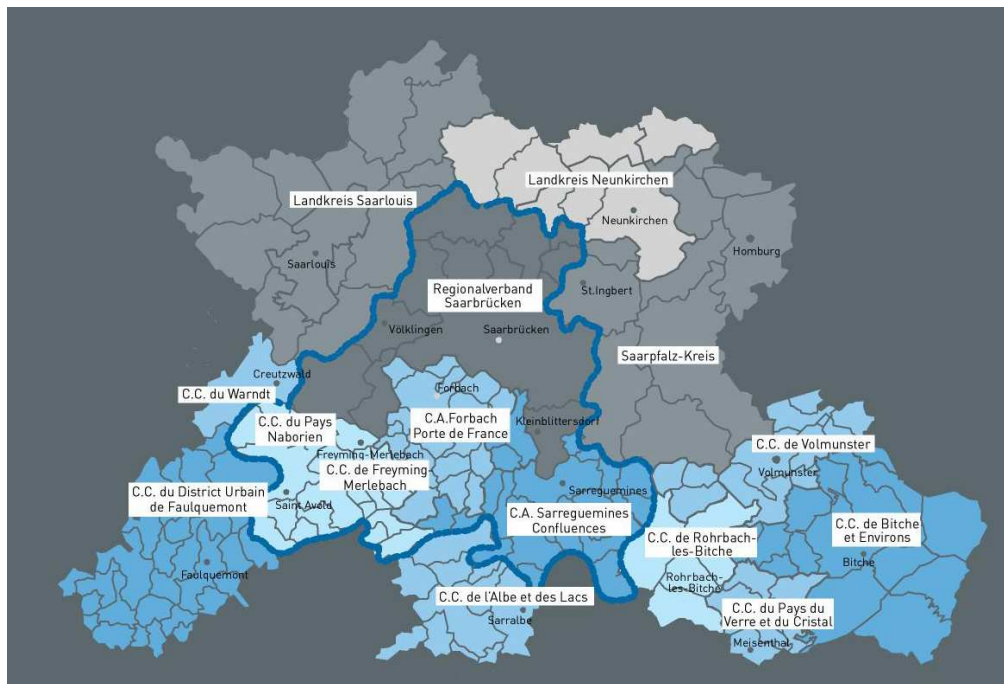


Fig. 1: Eurodistrict SaarMoselle 2010, Members 2010.

As mentioned before, the idea for this cross-border region with a changeful history is, to create a sense of unity. This should be achieved mostly by cooperation and cross-border projects, both on administrative and on social levels. Whereas the actual study project is focussing on a commercial zone management system with the Eurodistrict, 3 German and 6 French partners and its complex requirements, further going ideas will show the potential of embedding of social media for example.

## 2.2 Approach

Cross-border integration is always accompanied with problems and barriers. These barriers for this integration could occur mostly on multidimensional levels. The administrative level and the political frameworks are the ones which could just be hardly changed. Due to the social and cultural differences in border regions there are often problems on this planning level as well. The technical level (software, workflow, original data for example) often has big disparities between communities and especially countries, but these are the problems that could be solved, in particular by new, innovative technical solutions. Hence, one of the first projects in their new constitution of the Eurodistrict SaarMoselle was to develop a common, cross-border management for the commercial zones. If there is the will to cooperate between different kinds of areas and regions it is essential to manage the arrangement of kinds of land use, has a need for common strategies to avoid unrestrained usage of settlement and to give a basis for the management for the conflicts of use between the interests of the project partners. Hence, it is the logical step, to embed a land use monitoring, which is an observation over time, in order to as well achieve sustainability in an economic and ecologic way. This is as well the condition for the management and monitoring of the commercial zones, which is the reason for the cooperation between Eurodistrict SaarMoselle and TU Kaiserslautern. The idea was, to create a technical platform, comparable to a portal, that contains a coherent raw dataset with centrally managed spatial data and decentralized managed metadata for common cooperation. Furthermore, the aim was to organize and promote spatial data, first for the mentioned political and administrative purpose, in a second step to create a platform to attract and inform potential investors.

## 2.3 Eurodistrict SaarMoselle

Basis to organize this spatial data is a Geographical Information System (GIS). Guhse states that a GIS system is the „integral component of the information and communication technology in the administrative departments“. Usually, the term GISsystem is used for a specific, complex software package with a connected database, which is specified to organize spatial data and for geospatial analysis. Because there has to be a strategic and as well expensive decision for specific GIS system, the approach in this project was to set up first a “test balloon”, to show to potential of such technologies to the project partners. Our approach



for a first and easy to use solution was a combination between a website with embedded mapplets and the connection via scripts to a database file. In fact, it is not typical GIS by definition, but by its components, it is a geographical informationsystem that displays map based data and allows simple geospatial analysis. This small and thin solution makes it possible, to create results, which are manageable without any complex briefings for the project partners and is adaptable for requirements. Hence, it has not the full functionality and usability of a Desktop or Web GIS, but it is available via every usual browser nearly without any restriction. The existing data has been collected and homogenized via a web appearance by the use of existing open source web standards. Thus, this first easy to use solution to visualize results is rather a website connected to a database than a typical web mapping service or a Web GIS, which is still sufficient at this step. The software which was used for pre and post processing (QuantumGIS) is as well as the map database free available in order to avoid costs for the communities, which have naturally a very limited financial range and capacities. The first step of the technical realization was to think about a common database, which is accessible via Internet. Fundament for this should be Openlayers–platform (Open Source Geospatial Foundation) that allows it to embed maps from various sources like for example the free available Open Street Map as well as commercial providers such as Microsoft Bing (Microsoft Cooperation) or Google Maps (Google Inc.). After setting up this first step, the relevant commercial zone data of the project partners has to be aggregated. One big problem as well is to homogenize this data in terms of geographical projections and graticule. Standards on French and German side are different, even between the territorial communities on the French side are different geographical systems. This data has to be integrated in a webportal, which was made by the use of a mixture of shp files and kmz files. Another point is to adjust the arrangement and exposition of the data, whereas the project partners had different ideas about. Questions like the amount of published metadata, potential commercial zones, embedding of traffic zones and calculations have to be solved. This system needs a thoughtful composition and maintenance, with focus on data handling, avoidance of data redundancy, especially with a server and a lot of deventrally connected project partners from different countries with different workflows. This data is published in a first internal portal, just accessible for administrative authorities that have to complete the connected metadata. This metadata consists of additional information which are saved in the database and linked to the according commercial zone. These information can be divided into two groups. The first group contains information about the surface area of the commercial zone like community, total area, available area or pictures. The second group contains information about the contact partner for the according commercial zone.

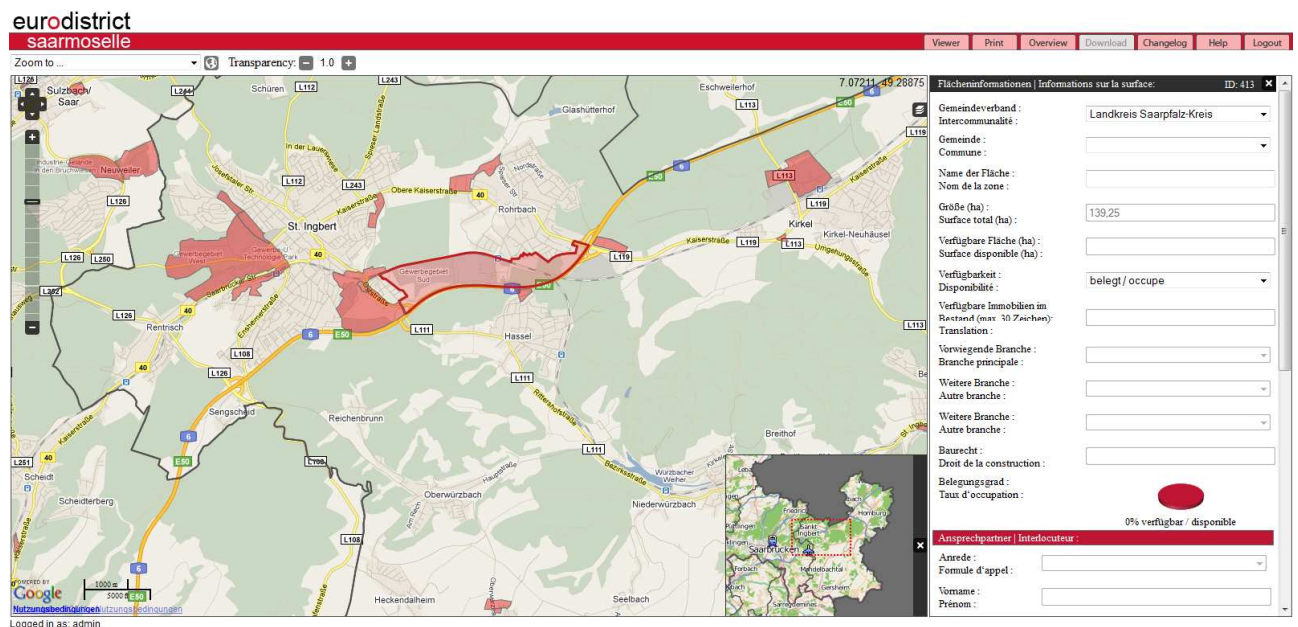


Fig. 2: Metadata editing of the Administration Portal.

Furthermore, the possibility is given to set up sample database queries and geospatial analysis (for example all free areas between 20 and 60 square kilometres), to get use of the connected data. Technical and administrative questions (who is running the system, how to organise the user rights for example) have to be solved in the future as well. The structure has to be flexible, to react on occurring problems, like a changing



composition of project partners, different administrative structures and workflows and different focus of usability. An approach for this complex task and further common projects could just be to achieve it with a step-by-step solution, initiate it from a slight and smart starting-point. In addition to this, it is important to involve the local authorities as much as possible in order to gain consent. This bottom-up-principle could act as a catalyst to raise the acceptance of this portal, because every project member is in charge for their own data also on the lower administrative levels is important to boost the subsidiary. For this point, the bottleneck of the system is the usage of the kml/kmz-files for the visualisation of the data and the shp/dbf format as database storage and the restricted functionality. With this solution, it is very easy to edit the metadata of the commercial zones but if the geometry of the zones changes or a new commercial zone is planned, it is necessary to edit the data with a Desktop GIS and re-import it to the system. A solution for this problem is the usage of a “real” geodatabase and a WFS-T as a backend. In this case the user of the Administration-Portal is also able to change the geometry of the commercial zones as well further complex tasks.

### 2.3.1 Administration Portal

The “Administration Portal” is closed for public visitors and aims especially for data input and to manage and aggregate the commercial zones by the cooperation members (compare Fig.2). The homogenising data (same projection mode and the method of collection) is displayed on this website and only accessible for the communities and they are in force to insert their own data.

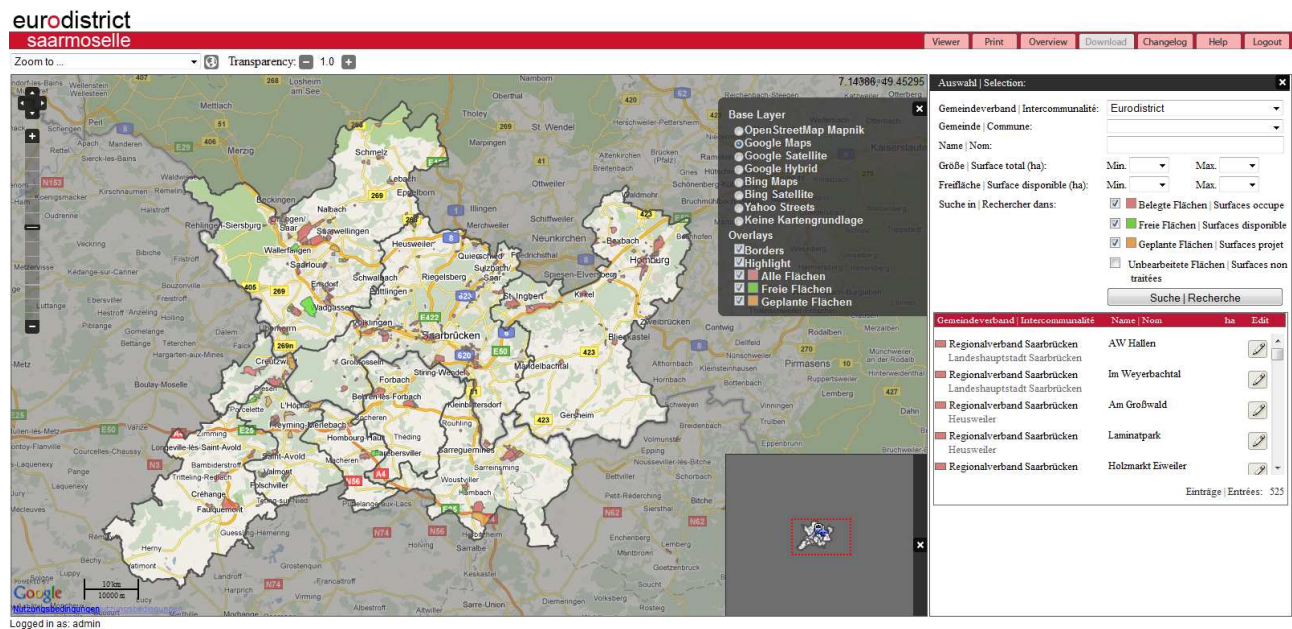


Fig. 3: Database query of the Administration Portal.

The strong focus on self-administration should aim for a better acceptance of such a portal and especially the way of working and collaborating. Hence, there will not be a typical top-down-oriented result because every member will be in charge of the quality of their own data and will feel responsible for it. Besides the data input, it gives the potential for more detailed geospatial analysis than in the open portal and it contains as well the planned commercial zones, which are already not legally fixed.

### 2.3.2 Viewer Portal

In addition to the internal “Administration Portal”, a “Viewer Portal” with the possibility for data-requests is developed to inform public visitors and investors and in a marketing purpose. It should result in a platform for spatial information. In order to raise the acceptance for such a common approach, on both German and French side, the availability for every partner for all collected data to a certain degree could raise its acceptance for example as well. The following screenshot shows a possible databasequery.



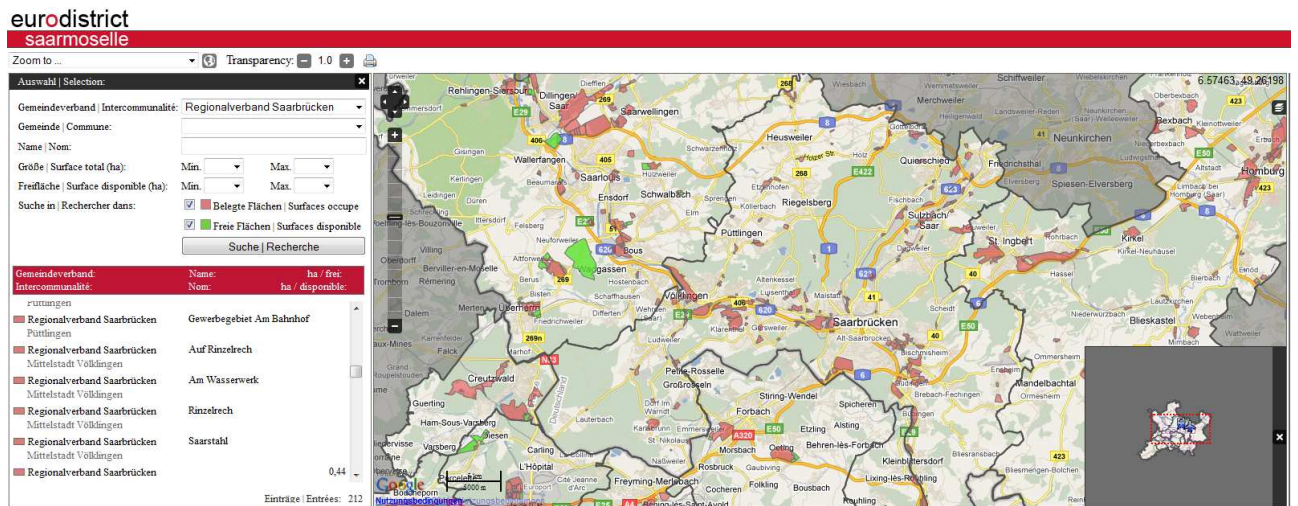


Fig. 4: Database query of the Viewer Portal.

This element gives possible investors the chance to find an adapted commercial zone and to get all necessary information of a commercial zone, like the dimension, available space, the prevailing business sectors or the contact person (compare Fig.5).

### 3 POSSIBLE FUTURE PERSPECTIVES

As mentioned before, the system is just a technical snap shot. Besides the mentioned functionalities, the integration of further analysis tools to monitor the commercial zone areas use is a logical progress, for example. By observing the changes with resilient numbers, it gives the chance for a sustainable evaluation of the cross-border commercial zones development. Even with the restricted functionalities, the requirements “observation, acquisition and interpretation of changes” Streich stated in 2005 for an at least simple spatial monitoring system are fulfilled. Further going thoughts intends to create a common portal for the region. However, these properties are not fixed so far, but there are ideas for a common spatial data infrastructure with connected map based data. An information portal like this to represent the region and to give its population a central contact point would not be only “just” a GIS, rather than geographical, web based community portal. Whereas on a larger scale, like for Greater Region Saar Lor Lux, a complex GIS solution is needed for regional planning and spatial observations and tends more to fulfil the requirements. Besides the European integration, the European Union pays also attention for the requirements for an information society, because “the development of our society towards an information society is an inevitable trend” (European Parliament, 2000). Thus, innovation and the knowledge society are mayor EU policies and are aiming for new creative solution to existing problems. Maybe, the first cross-border Geoportal with people involved, promote region as innovative with innovative projects could be one of them.

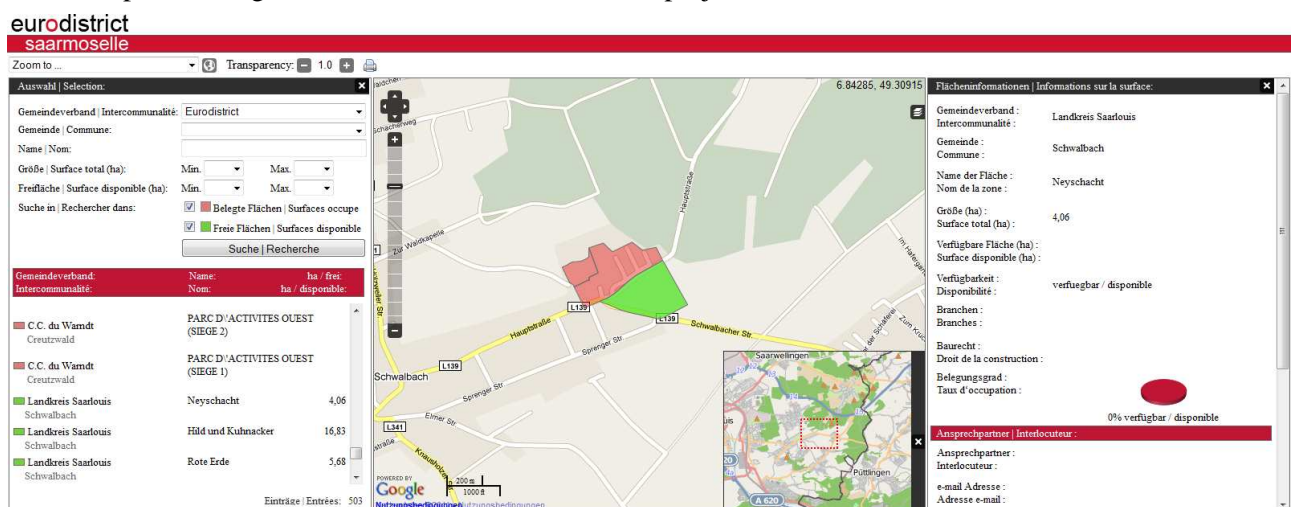


Fig. 5: Viewer Portal: Database query and detailed informations of the commercial zone.



The observation was made, that the Technical barriers especially on the software level are often easier to overcome than the complex and more static administrative ones between countries and other local units. Furthermore, on the roadmap for the Eurodistrict SaarMoselle is this commercial zones monitoring system just a first step – upcoming projects are for example a tourist guide and the mentioned common GIS solution. A logical continuation could be also a social community portal – with basis spatial data and linkage to social communities (facebook, flickr, Qype for example), in order to get more related content (facebook Like Buttons, photos, recommendation and events for example). O’Reilly highlighted this importance of this social communities and user generated content in the web 2.0 in 2005. The principle of those communities with the use of interactive and collaborative elements could foster the idea of integration. A possible first project could a common bicycle network in the region, which is enriched by posts, recommendations and connected to specific social community groups. By this, such a portal could be enriched with more information, which is relevant for the inhabitants of the Eurodistrict and could aim to link the portal locally. Plus, it might act as an interface between the local and administrative level. As mentioned, there is the potential to use media and new technical solutions to utilize people as driven forces for the cross-border integration. Hence, it is important as well that besides the authorities, the people have to be involved.

Another enriching element could be a user driven crowdsourcing data collection. By this, users are adding various data to system and are upgrading the database. Though, the integration of the commercial zones metadata (geometries later) shows this principle on a low level. Though, the whole potential is even bigger. This user generated content, added by desktop computers and especially by mobile devices will increase in the future and could lead to a stronger and vital connection between the users and their data. However, together with all of these chances, there will be some threats and requirements as well. There has to be a specific management and administration for this geographical attached information in order to avoid data cemeteries and to provide constant access. In addition, a base of technical standards and interfaces for the data use has to be developed in order to ensure resilient data sampling methods. Time will show, if this could be the European INSPIRE directive, or if more decentralised developments from the OGC could be more promising. Some spatial databases are still very fragmented at the moment, but upcoming standards in the rising field of spatial data usage, like Google Earth kml/kmz files for example, could show where the development could go in a short period of time. There should be the ability to integrate data from other servers as well via (web map service, web feature service), no matter if the data is private or public. When it comes to the point of embedding the web 2.0 and the ongoing developments in the GeoWeb, it is important to build a flexible construction in order to react on actual developments. A long planned and fixed All Inclusive solution will not be as successful as a step step solution on the long term. It is rather important, to have the ability to embed existing communities than to create a new one, which would be sentenced to fail. There will be no blueprint to create a cross-border portal which helps for the integration in the region, however with a sophisticated approach, it could a help to overcome the barriers from previous times and may aim to create a common spirit.

#### 4 CONCLUSION

The question was raised, if cross-border cooperation and integration could be achieved by the use of new media. There is a potential for that, though it is complex task which requires a flexible and multidimensional solution, even already for the comparatively small study case of the commercial zone monitoring system of the Eurodistrict SaarMoselle. Communities like facebook, flickr etc. don’t know borders and their crowd sourcing attitude could be used to raise the acceptance on the part of the population. At least it will be interesting to observe as well the differences between the requirements for administrative and social integration. The portal to manage the cross-border commercial zones is just a first step on a way with many difficulties and hurdles. However, it is a working tool and a first step, which could be used by German and French partners to work on common projects and may lead to further comprehensive solutions. When it comes to developments in terms of new media in the internet, one of their characteristics are, that there are mostly standardized and often have a big cross-border acceptance and a high degree of popularity like facebook for example. They are already often working “cross-border”, and they could boost cross-border integration. Thus, Geoportals combined with the integration of communities could be run also under different ideas, like for example tourism issues or comprehensive spatial planning. Networks from a technical perspective and networks from a human perspective could enrich each other reciprocally and



activate endogenous potentials. The fundament for such a development is a strong connection with location-based communities and of course mobile availability of them.

Questions like the missing standards in terms of software and origin data and different administrative levels just for a small project has to be solved. The possible successor of a more complex portal will raise other questions as well, like for example data management and data privacy. In particular the question, what kind of data is public data and what is the intention of the project partners. The more the data is organized decentralised with the principles of subsidiarity, the higher is the risk to create data cemeteries and redundancy. A tourism portal for example could be open for everyone. The people who wants to insert new data, share their opinion with others or in general wants to communicate with other users about their cross-border region. This could be one step to create and strengthen a cross-border consciousness. Furthermore, these new collected data is not only useful for an interested user who wants to inform himself, but also for the planner. Depending on the offering of the portal, he could develop new strategies for up to now unknown problems. If fallow land and empty sites are integrated in the portal, the planner could analyse the actual stock and compare it with the population development to adjust his further planning. An expanded portal could be useful for both the planner (spatial data) and the citizen (information and communication). Due to the fact, that computers, internet and social networks are getting more and more ubiquitous in people's life, so their potential to solve such tasks has to be used. Integration on an European scale shall show, that differences aren't that big on the other side of the border – common work and a common platform could show, how this work and integration may develop with the new possibilities of technology and media. This is the point, where such a portal could act as an interface between the administrative (local authorities) and social (inhabitants) level. The intention is to strengthen the idea of one cross-border region both in peoples and governmental heads. To push forward and maintain this integration is task of spatial and urban planners.

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