OECD eXplorer: Making regional statistics come alive through a geo-visual web-tool

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Abstract

Recent advances in web-enabled graphics technologies have the potential to make a dramatic impact on developing highly interactive Geovisual Analytics applications for the Internet. An emerging and challenging application domain is geovisualization of regional (sub-national) statistics. Higher integration driven by institutional processes and economic globalisation is eroding national borders and creating competition along regional lines in the world market. Sound information at sub-national level and benchmarking of regions across borders, therefore, has increased in importance in the policy agenda of many countries. In this paper, we introduce "OECD eXplorer" – an interactive tool for analyzing and communicating gained insights and discoveries about spatial-temporal and multivariate OECD regional data. This database is a potential treasure chest for policy-makers, researchers and citizens to gain a better understanding of a region's structure and performance and to carry out analysis of territorial trends and disparities based on sound information comparable across countries. Many approaches and tools have been developed in spatial-related knowledge discovery but generally they do not scale well with dynamic visualization of larger spatial data on the Internet. In this context, we introduce a web-compliant Geovisual Analytics toolkit that supports a broad collection of functional components for analysis, hypothesis generation and validation. The same tool enables the communication of results on the basis of a snapshot mechanism that captures, re-uses and shares task-related explorative findings. Further developments underway are in the creation of a generic highly interactive web "eXplorer" platform that can be the foundation for easy customization of similar web applications using different geographical boundaries and indicators. Given this global dimension, a "generic eXplorer" will be a powerful tool to explore different territorial dimensions (countries, regions, cities, rural areas) according to the different needs of users.

1. Introduction

We live in a data-rich world where people have become familiar with notions like GDP and sustainable development; statistics that compare countries' economic performance often hit the news headlines. At the same time, people want to see statistics that describe the places where they live and capture the quality of their own lives, taking into account a broader perspective beyond the economic one. The geographical level to which statistics are referred is, therefore, increasingly important. Even though international comparisons of economies and societies tend to be undertaken at the country level, economic performance and social indicators can vary within countries every bit as much as they do between countries (OECD 2009a). Comparing a region's competitiveness in the global arena requires sound statistics and data, but such information is often limited and complex to be visualized. How can the existing information be made available in a way to enable decision-makers and citizens to fully explore and make use of it? How can different sources of information be pooled together and transformed into knowledge for decision-making?

This paper reflects a challenging applied research task to stimulate, at global level, an exchange of best practices through collaborative Geovisual Analytics reasoning (Thomas and Cook 2005). Tools are introduced to help gathering and sharing national and local initiatives aimed at measuring economic, social and environmental developments and to engage policy makers, statisticians and the public in collaborative activities. The global dimension of such a task responds to build a repository of *progress indicators*, where experts and public users can use Geovisual Analytics tools to compare situations for countries, regions or local communities.

While the benefits of Geovisual Analytics tools are many, it remains a challenge to adapt these tools to the Internet and reach a broader user community. Important features include dynamic web-enabled visualization and animation that enables statisticians and regional experts to explore geospatial demographics data from multiple perspectives (Brodbeck and Girardin 2003; Roberts 2004; Jern et al. 2005), discover interesting relationships, share their discoveries with colleagues (Wohlfart and Hauser 2007; Jern et al. 2008) and finally communicate selected relevant knowledge to the public. These discoveries often emerge through the diverse backgrounds and experiences of expert domains and are precious in a creative analytics reasoning process.

In this context, we introduce a dynamic web-enabled demonstrator "OECD eXplorer" (*http://stats.oecd.org/OECDregionalstatistics/*), a customized tool for interactively analyzing, communicating and collaborating gained insights. It includes a snapshot mechanism that captures, re-uses and shares findings. We customize tailor-made and task-oriented applications based on layered components thinking. The key feature of OECD eXplorer is its deployment to Internet users for dynamic web. A first version of OECD eXplorer was released in November 2008 on the OECD web-site. An extended version, released in March 2009, enhances the possibility to explore trends over time, provides novel functions for presenting stories about the statistics and combines metadata and maps status.

This paper is organized as follows: Section 2 describes the needs for such a tool for the OECD work on regional statistics, followed by related work in other areas (Section 3). The architecture and main components

of the GAV Flash framework are described in Section 4, the integrated snapshot mechanism in Section 5 and Adobe Flash-based time animation in Section 6. Section 7 discusses how regional information is presented in OECD eXplorer, drawing examples from the OECD Regional database and recalling how the main issues that emerged during the evaluation phase have been addressed. The last section concludes and sets out future global project developments.

2. The OECD user perspective

OECD countries have experienced a growing interest in regional development in recent years (OECD 2009a). The performance of regional economies and the effectiveness of regional policy help determine a nation's growth and shape the measure of well-being across countries. For the past years the OECD has been studying regional disparities and regional economic growth in its member countries in order to evaluate innovative strategies for development and spread successful policies.

This interest has generated new demand for sound statistical information at the sub-national level on factors that are important to regional competitiveness. The *OECD Regional database* (OECD 2009c) is a unique source of statistical information at sub-national level for all the OECD Countries. It contains yearly time-series for around 40 indicators on demography, economic and labour market performance, education, healthcare, environmental outputs and knowledge-based economy. Within each country regions are classified on the basis of two territorial levels: the higher level consists of 335 large regions in the OECD countries, while the lower level comprises 1,681 small regions. OECD has since long felt the need to make regional data much more easily available on the web in an interactive and user-participative way. In particular, to make a more extensive use of dynamic web-enabled maps which can, more effectively than a graph, convey the four dimensions included in the regional database: statistical indicator, time, regional and country value (Image 1).

In addition, timely information on the progress of a local community requires crossing different sources of information and new ways to generate and share information for decision-making.

Finally, many analysts and citizens want to create content and express themselves through "user-created knowledge" and a more pro-active, collaborative role in content creation, distribution and shared use. Active users and user-centred innovation are increasingly important and could have a beneficial social impact.

Target groups for such a knowledge-generating, collaborative GeoAnalytics tool are quite diverse. A primary target group is policy-makers in charge of regional development policy, who can make use of this tool in their decision process. As well as statisticians and analysts involved in policy analysis and evaluations. Citizens and the media would also be able to get informed and at the same time participate in increasing the knowledge on how life is lived – and can be improved – from region to region.

Because of the different expertise and needs of the target-groups, the tool should be flexible and adaptable to different audiences.

Image 1: A dynamic OECD Visualisation Web Report
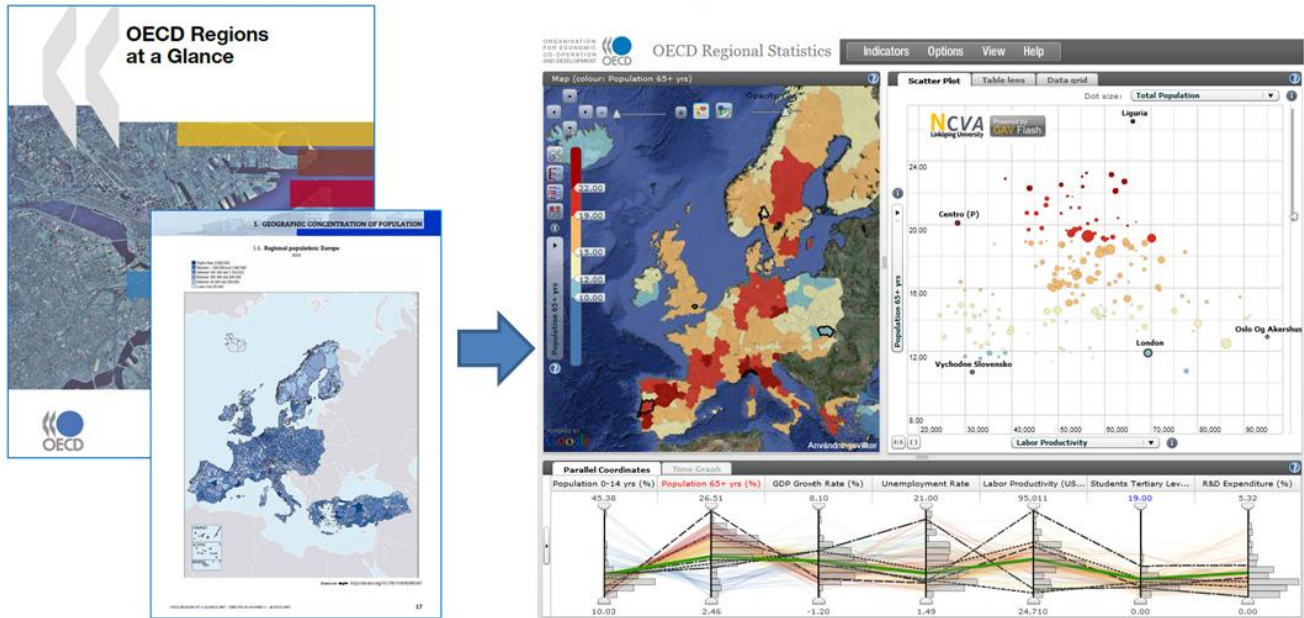
3. Related work

Massive volumes of geospatial statistical data are today generated all over the world but not used as effectively as one would wish for. Too little focus has been given to making GeoAnalytics technologies useful and accessible to statisticians. A common and functional multivariate geovisualization research method, such as the parallel coordinates plot (PCP) used in CommonGIS (Andrienko et al. 2003), is still unknown to the broad statistics user community. Despite the advances in web graphics technologies, comparatively little research has been focused on more advanced dynamic GeoAnalytics applied to Internet users. The most well-known tool is GeoVISTA Studio, an open source Java-based visual programming environment that is commonly used for developing Internet applications within the research community (Geovista studio 2006). Rosling has dramatically increased the awareness of geovisualization tools among the world of statisticians by exploring his most efficient Gapminder time-animated bubble plots (Rosling 2006).

The importance of providing explorative sessions in geovisualization and incorporated features to capture and reuse interactions and integrate them into electronic documents was early demonstrated by MacEachren (MacEachren and Brewer 2001) and Jern (Jern 2001). CCMaps presents a conditioned choropleth mapping tool that allows users to save snapshots and reuse them for presentation purpose. More recent efforts were made by Visual Inquiry Toolkit (Guo et al. 2006) that allows users to place pertinent clusters into a "pattern-basket" to be reused in the visualization process. Robinson describes a method they call "Re-Visualization" and a related tool ReVise that captures and re-uses analysis sessions (Robinson 2006); Keel describes a visual analytics system of computational agents that support the exchange of task-relevant information and incremental discoveries of relationships and knowledge among team members commonly referred to as sense-making (Keel 2006). Wohlfart describes a storytelling approach combined with interactive volume visualization and an annotated animation (Wohlfart and Hauser 2007).

Many capture and reuse approaches are limited to be used within the same application environment that may well require a software license and are not always easily accessible to team members without installing external software. Increased computer security practices tend to limit this possibility. In this context, we introduce a web compliant layered component toolkit facilitating a snapshot mechanism that captures, re-uses and shares active properties for individual functional components. We demonstrate that such an implementation can provide a more open and collaborative GeoAnalytics framework for public use (OECD

2009b).

4. System implementation

OECD eXplorer was developed and customized using NCVA's own GAV Flash framework. A previous version for Microsoft's Net and DirectX is described in Jern and Johansson (Jern and Johansson 2007). In this new version, our geovisual analytics methods have now been adapted for the Web 2.0 using Adobe's Flash basic graphics and Flex for user interfaces. Programmed in Adobe's object-oriented (OO) language ActionScript, GAV Flash (Image 2) and OECD eXplorer facilitate 100% deployment to the Internet - a requirement from OECD and its associated global statistics community.

Image 2: GAV Flash uses the Adobe Flash API for graphics and integrates with the Adobe Flex Framework
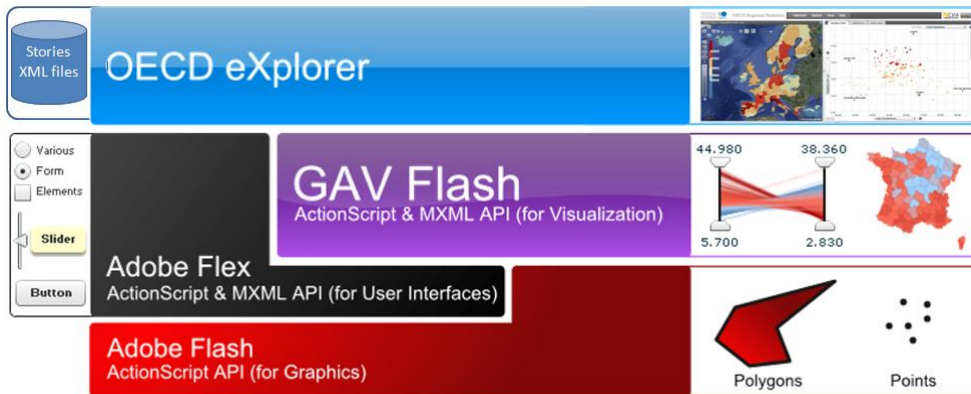

GAV Flash includes a collection of common geo-visualization and information visualization components, data analysis algorithms, tools that connect the components to each other and data providers that can load data from various sources. Interactive features that support a spatial analytical reasoning process are introduced such as tooltips, brushing, highlight, visual inquiry and conditioned statistics filter mechanisms that help detecting outliers.

As GAV Flash is built upon Adobe Flex, a developer has access to all Flex user interface functionalities. By combining buttons, panels and sliders with visual representations, applications can be easily customized. The open architecture allows new tools to be incorporated with the already existing components, e.g. statistical analysis tools or visual representations.

All GAV Flash components rest on different basis such as visualizations, managers or data providers and interact with each other, without knowing the exact nature of the others (Image 3). A visual component needs a data provider to function, but the source of data can be different, from a simple Excel sheet to an extensive database. The data run through the data provider in order to create a common formatting that all the other components can understand. By separating the data structure from the visual representations, applications are created that work regardless of input, so that data can be supplied from the outside and linked into the system with minimal programming skills.

All visual components (Image 3) use the same data storage class, *Data Cube*. This class is also used in the analysis to calculate different properties of the indicators, such as percentiles and histograms. Data loading is implemented separately for each data source type. For example, the Excel Reader loads an Excel spreadsheet and creates a data cube containing the data from the spreadsheet and the rest of the framework does not need to know anything about the data source. Data providers can be customized to support many types of sources. Excel is one of the simpler ones, while direct data base connections via a standard such as SDMX (SDMX 2009) are more advanced and often require advanced technical skills from the user.

Image 3: GAV Flash component architecture
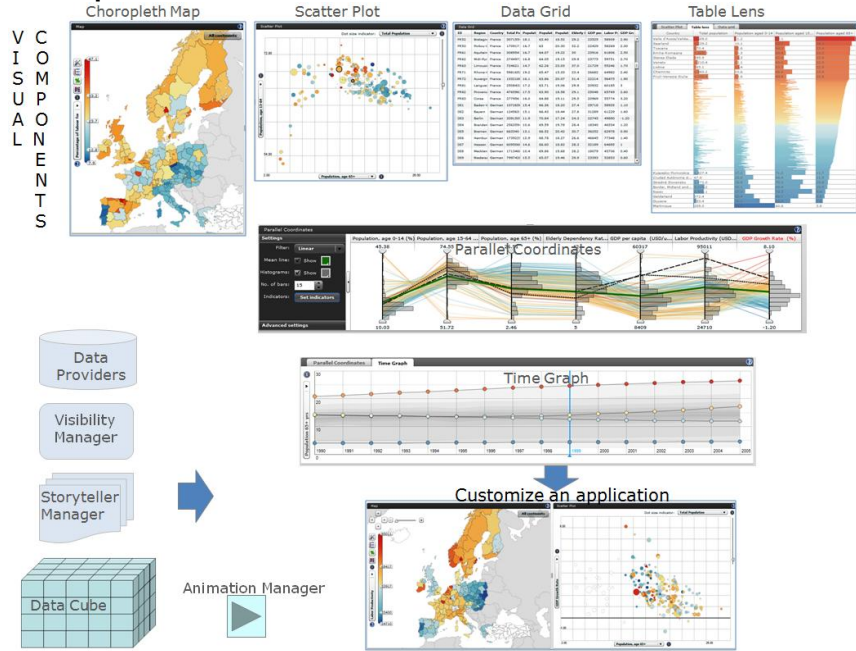
4.1 GAV Map Layers

The choropleth map component facilitates a novel layered architecture for simultaneous transparent views of multiple map layers. It means that each class of spatial information is represented by its own layer, e.g. glyph, shaded map and Google map. These layers can then be combined and controlled to be displayed, hidden or transparent depending on the needs of the user (Image 4).

Image 4: GAV Flash Map Layer Component with three map layers glyphs, shaded map and Google map
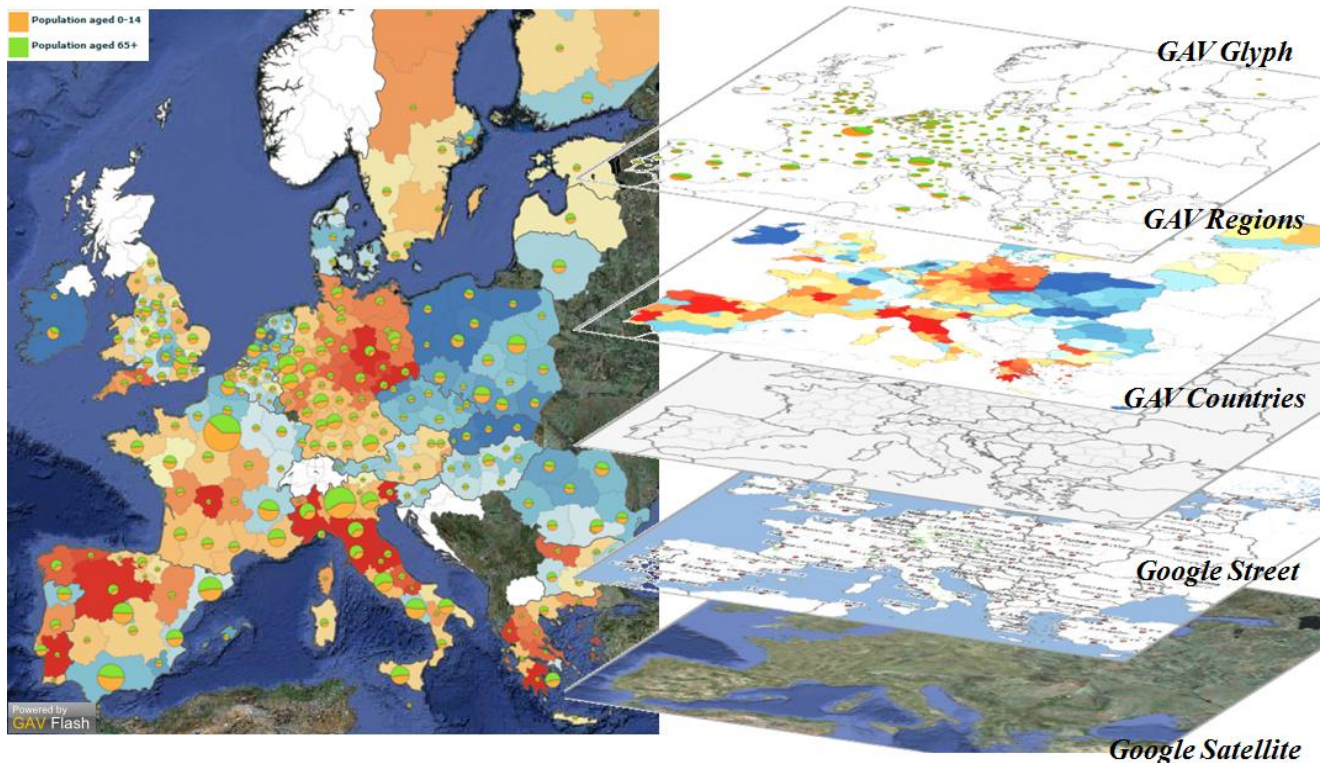
In a typical GAV Flash application (Image 1) each visual component is added to a *Selection Manager* and a *Visibility Manager*. The selection manager receives selection events (such as clicking in the Map) from each component and then forwards these events to all other components. The visibility manager also listens for and forwards events, but in this case from filters that hide spatial regions based on some criteria. Both the selection manager and the visibility manager store a state (e.g. selected, visible) of each data record.

A minimal GAV Flash application contains a data provider and an interactive visualization component such as the *Choropleth Map (*or *Parallel Coordinates Plot, Scatter Plot* etc*)*. An application with a single visualization component does not need any selection or visibility managers since they only deal with interaction between two or more components. The visualization uses a *Data Cube*, supplied by the *Data Provider* to calculate and create its own special view of the data, such as a colour scheme, correlation plot or a histogram.

4.2. Dynamically linked views

Spatial and multivariate data are effectively analysed through the use of multiple-linked and coordinated views (Roberts 2004; Jern et al. 2005). In order to detect complex patterns it is convenient to view data through a number of different visual representations simultaneously, each of which is best suited to highlight different features. GAV Flash facilitates an object-oriented architecture with compulsory components (selection manager and visibility manager etc. – see Image 3) integrated with Adobe Flex layout management. This integration provides alternative and different views of the statistical data that can help stimulate the analytical visual thinking process characteristic of the GeoAnalytics reasoning. The views are separated by interactive splitters allowing the user to scale the individual views and allocate more space to the visual representation that is most important.

Spatial-temporal and multivariate statistical data are simultaneously explored through the use of dynamically linked multiple views to detect complex patterns and problems as described in more detail below. The views are coordinated using the GAV data linking method based on the data cube model (see image 3) and colouring scheme. Any filtering or highlighting made in one of the linked functional components is transmitted to all the others. Image 5 is an example of an eXplorer linked view scenario (choropleth map, scatter plot and parallel coordinates) applied to the Italian TL2 regions. The chosen colour map indicator is "percentage of population

aged 65 and more". Two regions, Lazio and Liguria, are highlighted in all three views for comparison. Each string (line segment) in the PCP (see paragraph 4.3) represents an Italian region, coloured according to a chosen indicator. Each of the five vertical axes represents an indicator (the red one is the one analyzed). Lazio and Liguria are represented with different highlighted dotted profile lines and can be compared for all indicators in the same visual representation.

Image 5: OECD eXplorer uses dynamic multiple linked views
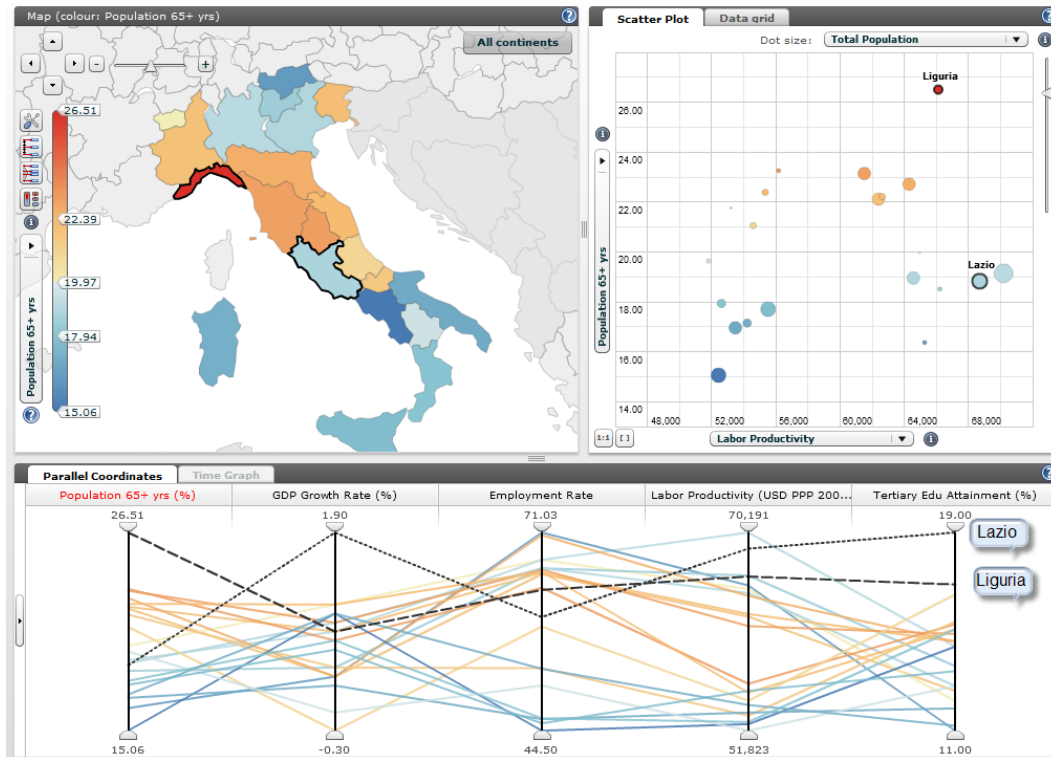
## 4.3. Parallel Coordinates Plot (PCP) in Adobe Flash

The strength of the PCP has already been demonstrated in many scientific environments (Inselberg 1985; Andrienko et al. 2006); it represents a proven geovisualization technique that enables visual representation of spatial multivariate data and hence a key explorative mechanism in a Geovisual Analytics application. The technique supports a large number of tasks for analyses of relationships between indicators. In the case of OECD eXplorer, each region is represented by a string passing through the parallel axes. Each axis represents a single indicator in the data cube. A string forms a visual representation of the characteristics of one region. Differences between selected regions can be found by visually comparing the profiles representing them. Dynamic range sliders are attached to each axis and the user can dynamically select or combine filter methods thus altering constraints on indicator values shown in the other views (Image 6).

Image 6: Parallel Coordinate Plot for analysing and comparing regional data
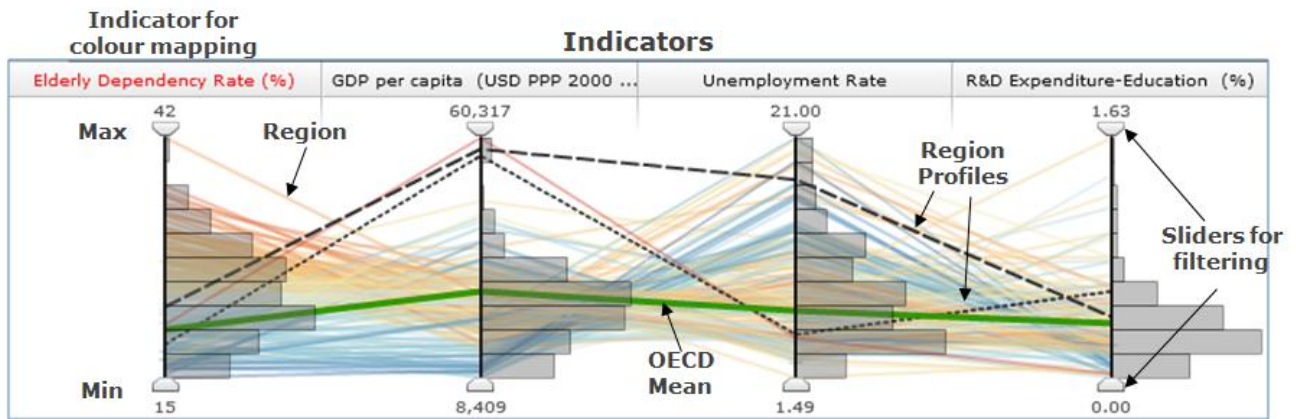
This PCP has been extended with special features that are important to statistical exploration, such as histograms and filter operations based on percentile statistics (Jern and Johansson 2007). Histograms attached to each axis are used to visualize the distribution of indicator data, splitting the axes into a user defined number of equally high rectangular areas (bins). The width of a rectangle indicates the frequency of regions intersecting that bin, the more regions within an area the wider the rectangle (Image 6). Dynamic Flash animated histograms have proven helpful by OECD for analysing multivariate temporal indicator data.

Statistical filter methods based both on ranges chosen by the user and on percentile calculations are embedded in the PCP attached to an indicator. Image 7 (top) shows only regions which fulfil two conditions controlled by dynamic sliders along the indicators axes: a) Labour productivity must be higher than the OECD mean value (green line) and b) unemployment rate must be lower than the mean value. Two regions Oslo and Liguria which comply with these conditions are highlighted. Image 7 (bottom) shows the regions with the highest (above 90th percentile) and the lowest (below 10th percentile) labour productivity. Oslo's profile is highlighted.

Image 7: Parallel Coordinates Plot to filter data
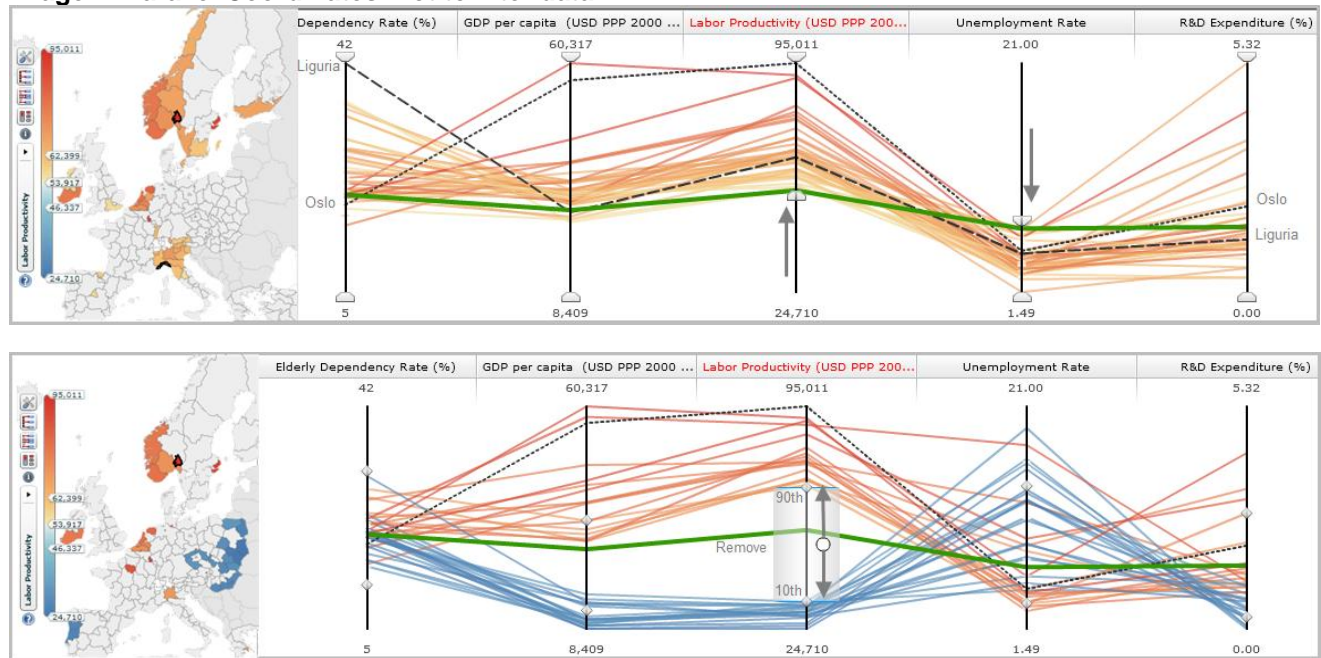
4.4 Getting data into eXplorer

There are several ways to load data into eXplorer. First, data can be preloaded using a Unicode text file format (UNICODE), which is a simple spreadsheet format generated by Excel. The OECD regional database is preloaded in eXplorer (arrow 1), thus the user has only to retrieve the indicators and years he wants to show by clicking on the name of the indicator. Second, data can be imported by the user from a client local data file using an Excel-like format "Unicode" (arrow 2). With this option the user is able to visualize additional data together with the OECD regional database, achieving a great flexibility. Finally, external data can be included in story xml (arrow 3, see paragraph 5). Stories built from temporal data are marked with a "movie" icon.

**Image 8: Different ways to load data into eXplorer**
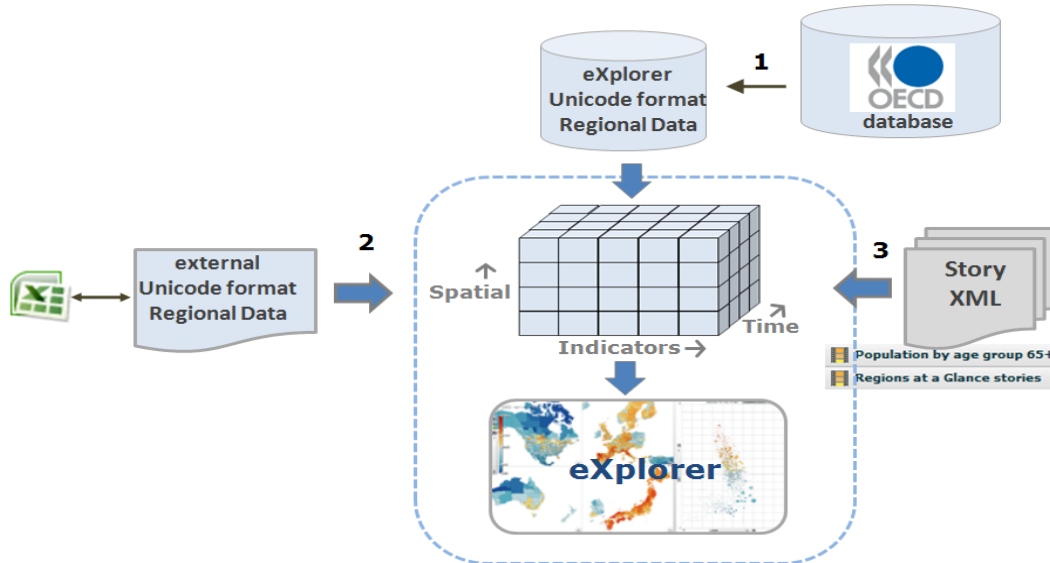
5. Collaborative GeoAnalytics through storytelling

Complex and collaborative geovisual analytics tasks require the external representation and visual organization of information. These methods can help users compare, organize, comprehend and reflect on what they know, quickly access specific information when needed, remember relevant thoughts and ideas, as well as exchange knowledge and develop a shared understanding with other people. Computer generated visualizations usually explicitly state relationships among information items, thus allowing for quick and non-ambiguous explorations of an information space. Information constellations generated by human beings are often vague in regards to relationships, thus inviting more creative interpretations of an information space. The GAV Flash Framework integrates tools for both collaborative interactive visualization and sense-making. A story indicates a successful suggestion and subsequently fosters additional suggestions based on similar considerations. This learning mechanism allows our storytelling system to improve the accuracy of its suggestions as well as to dynamically adapt to particular users, tasks and circumstances. Colleagues can review a story arrangement and respond with suggestions and comments, which can subsequently foster additional suggestions based on similar considerations.

OECD eXplorer facilitates the architecture to support means of capture an image, add descriptive text, save, packaging and sharing the results of a geovisual analytics process in a series of snapshots "Story" (image9). When the button "Capture" in the *Story Editor* is pressed, the state of each GAV Flash (i.e. map, PCP, scatter plot or time animation) in OECD eXplorer is saved together with user-defined text. Before closing the application, the user can export the story into an XML formatted file. Other users can follow the analyst's way of logical reasoning by loading selected stories through descriptive text combined with interactive visualization. At

any time a team member can access stories and apply them in OECD eXplorer or any other GAV Flash application assembled from the same components. A comprehensive story in the context of a remote collaborative sense-making activity can thus be created by the analyst through a set of linked snapshots (chapters). Users will discuss relevant issues through storytelling based on solid evidence, thus raising awareness and increasing the common knowledge on a certain phenomenon.

**Image 9: How to capture, save and share a story on Explorer**

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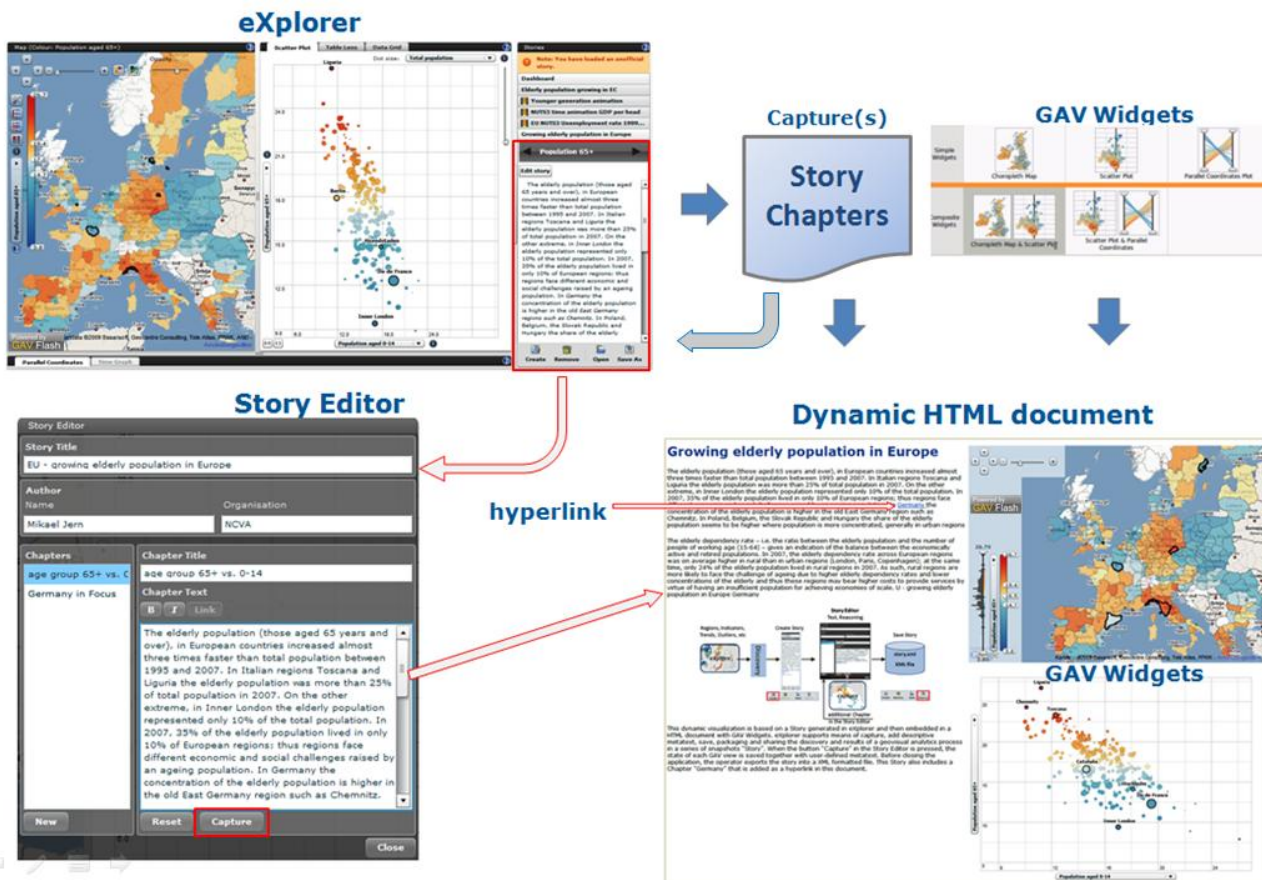
6. Applying Flash-based time animation

GAV Flash employs a data model (Image3) optimized for handling spatio-temporal and multivariate indicator data sets in a GeoAnalytics context (Franzén and Jern 2006). This conceptual data model can be seen as a data cube with three dimensions: space, time and indicators. The spatial dimension is represented by the OECD TL2 or TL3 regions, the indicators are the socio-economic indicators (GDP growth, elderly dependency rate, etc) and time are the yearly values of the indicators. The general method for finding a value in the cube is by its position (space; time and indicator). Of course different definitions of space, time and indicators can be applied in eXplorer.

Space-time-indicator awareness means that the data cube can be analysed and visualized across all three dimensions simultaneously. OECD eXplorer performs this task by integrating and time-linking three visual representation views: choropleth map, PCP and scatter plot (bubble). The bubble plot is demonstrated to be an effective Flash-based time animation method (Rosling 2006), but integrated and linked with a choropleth map and a multivariate indicator frequency histogram embedded in a PCP, makes it even more useful. The GAV open architecture, which can handle large datasets and integrated snapshot mechanisms, is another important

extension to this emerging animation technique. The spatial visualization for the time-linked views was evaluated by OECD and Statistics Sweden and found to be both intuitive and innovative. Statisticians discovered interesting trends in all three views respectively.

Image 10: Time Animation in eXplorer applied to OECD TL3 regions
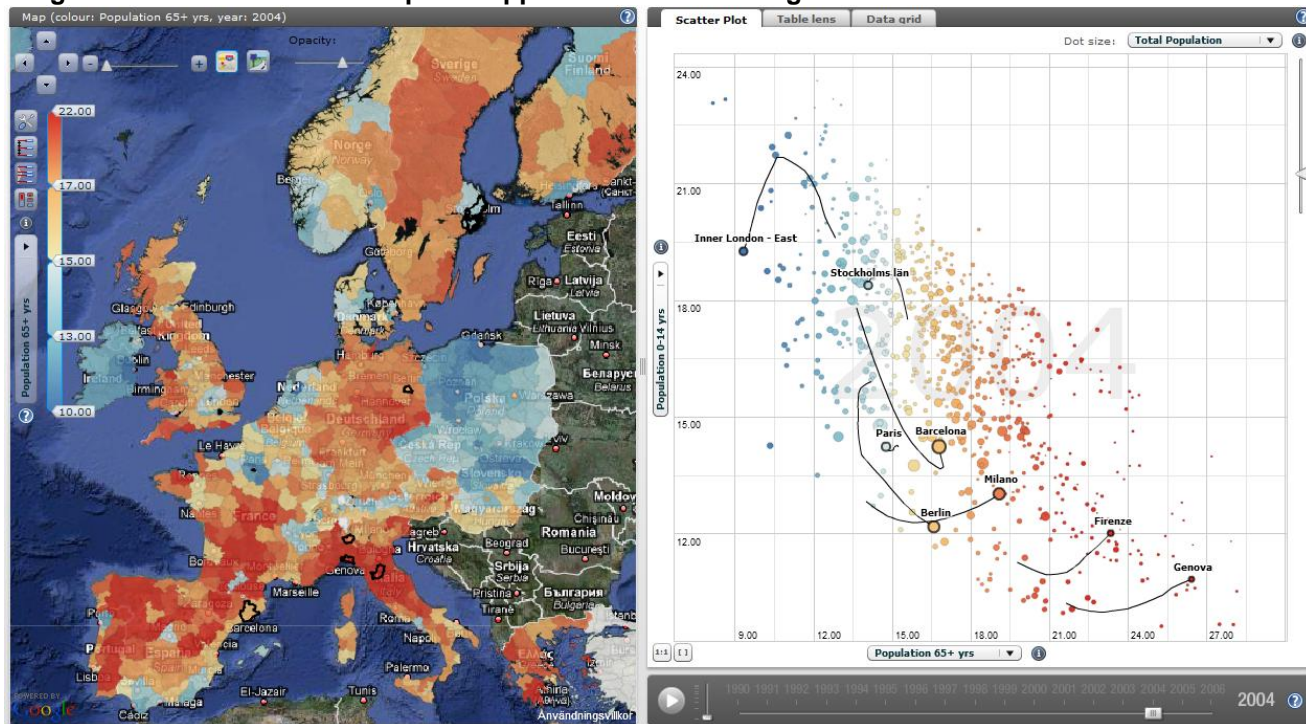
7. OECD eXplorer: The history and the results

When the OECD and Statistics Sweden organised a seminar on innovative methods of generating knowledge from statistical information in Stockholm in May 2008, OECD and NCVA became partners, and it became apparent that the tools developed by NCVA had a lot of potential to meet the wishes of OECD. This started a cooperation that resulted, a few months later, in the launch of OECD eXplorer on the OECD's web site.

NCVA demonstrated ability and will to adapt the tool to the needs expressed by the OECD, and later to the proposals expressed by pilot key users during a two months trial, thus adjusting eXplorer in an ideal way to user needs. The current version of OECD eXplorer has two identical tools to analyze, respectively, statistics on large regions and small regions. This choice was made to avoid complexity and long downloading time of large geometry files. OECD regions are analysed through four separate application scenarios grouping countries in continents and according to the territorial level chosen. The latest addition, *OECD Factbook eXplorer*, provides all the country statistics contained in the flagship publication OECD Factbook 2009.

The choropleth map dynamically linked with a PCP and a data grid gives the users facility for simultaneous analysis of the geospatial data. The use of the filtering function in OECD eXplorer, through the percentile distribution, helps visualizing the regional distribution within national borders and comparing it across countries. The use of lines and mean values in the PCP can help identify those regions that outperform their country or the OECD area as a whole and those that lag behind. Finally the scatter plot can highlight correlation among indicators and patterns of association among different types of regions. And the time animation adds the possibility of viewing the changes in all these patterns.

7. 1. Evaluation

The OECD eXplorer development followed a user-centric design approach (Andrienko et al. 2003). A

combination of domain experts from OECD, statistical managers and selected users of OECD statistics outside the organisation have been involved in the various stages of the prototype design and implementation, providing user feedback about usability and utility evaluation. The user-centric design process involved public access to beta versions of the web-based tool, allowing focus group discussions. The overall involvement and reactions have been very positive. Many useful suggestions for improving the functionality were made and have been incorporated in successive iterations.

A number of characteristics of the current version of OECD eXplorer derive from comments received during the evaluation phase. Firstly, users asked to have help functions and tutorial features for dynamic web-enabled GeoAnalytics tools, since the targeted audiences is not expert in geo- or information visualization technologies. Secondly, users asked to keep the entire structure sufficiently simple, while maintaining some functions to analyze data and not only visualize them. In this context, for example, the PCP was considered not to be self-evident to traditional users of statistics, as this is a technique that has not previously been employed in the statistics community and is not described in the methodological literature on statistics; therefore it was decided to keep it hidden in the start-up phase; at the same time it was regarded as a valuable addition to the statistical toolbox, especially the possibility of dynamically filtering to discover outliers and use profiles to make comparisons between highlighted regions. Finally, the dynamic links between views (context and focus maps, scatter plot, PCP and table grid) were evaluated as very important.

The test phase also revealed limitations that had to be addressed, e.g. resource demands when accessed on the web, resulting in too long times for data uploading and response. It also became clear, for example, that not all the institutional users had the possibility to have the latest versions of Flash installed on their client pc's.

7.2 Towards an open eXplorer

Following the release of OECD eXplorer in March 2009, further developments have been achieved in the direction of customizing the application to better suit different potential users. The aim is to build an "open eXplorer" or a generic platform that can be distributed to institutional partners (National Statistical Offices but also other organizations), and easily customized according to their needs. Explorer would then become the common platform used by different organizations increasing the integration and exchange of information. These recent developments have followed the same user-centric perspective used in the first releases of OECD eXplorer: Potential users have been involved in expressing their specific needs and evaluating the technical solutions adopted by NCVA.

So far the following tasks can be customized by NCVA's "*eXplorer Wizard*" developing a new eXplorer implementation (see Image 11): Shape files (regional boundaries), Indicator files and map projection, so that different territorial partitions can be visualized (focusing on one country, depicting more detailed geographic boundaries etc.), company logo, language support for the help file, and panel graphical users interface buttons so that the application can be hosted on an institutional website using an associate language. Finally different layouts for maps view are allowed and stories can be preloaded to give even further flexibility of use to eXplorer.

Image 11: The program "eXplorer Wizard" can be used by different organizations to customize eXplorer
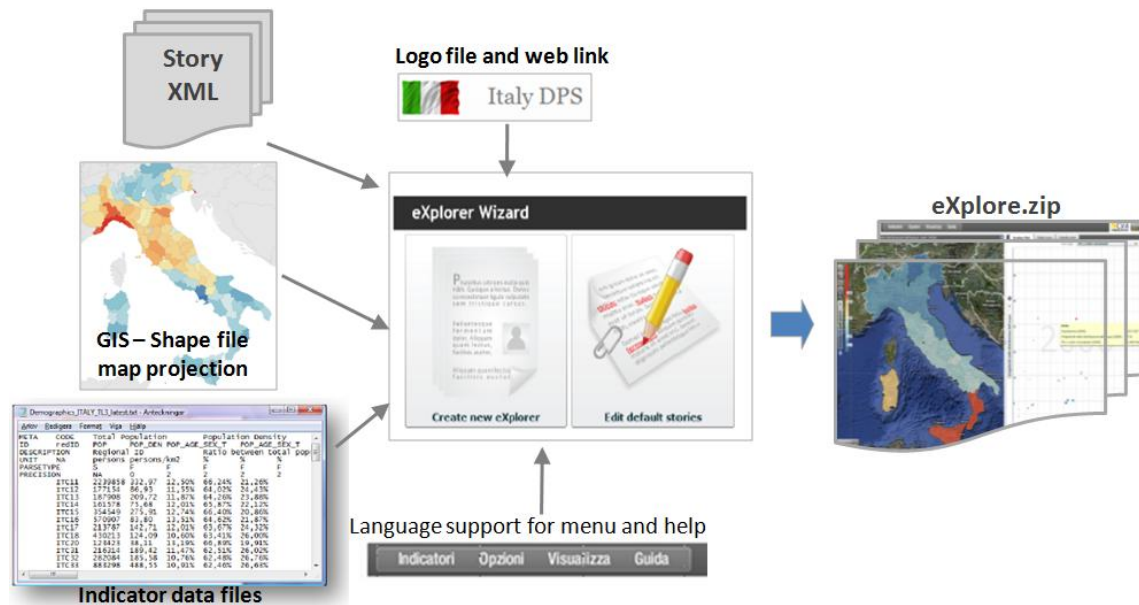
8. Conclusions and future developments

The authors expect that the web-enabled OECD eXplorer (OECD 2009b) will enhance the use and understanding of OECD regional statistics, thus contributing to build evidence-based decisions. At the same time, it will encourage the practical use of advanced GeoAnalytics science technologies because of its easy accessibility on the Internet. It will enable the analyst to take a more active role in the discovery process of exploring regional indicators, for example, to identify those regions that outperform others, or detect common pattern among regions across countries. The tool will increase the interest in and knowledge of local factors for development among specialist as well as non-specialist users. Feed-back from domain experts and statisticians who have started using the tool shows that a sense of analytical reasoning and speed-of-thought interaction is achieved through the ability to dynamically link views in OECD eXplorer and thus see the multi-dimensionality of regional development.

Major achievements on the technical side can be summarized as follows:

- Geovisual Analytics framework and layered component architecture have been developed in the O-O language ActionScript with 100% deployment to Internet users;
- Possibility to capture and save discoveries and knowledge (including time animation) with attached analytical describing text f to be communicated and shared with team members or the public;
- The on-going development of an open "eXplorer" platform that can be the foundation for easy customization of similar dynamic web applications using different geographical boundaries and indicators and be publicly available;

The OECD eXplorer version launched in March 2009 together with the report OECD Regions at a Glance (OECD 2009a) includes three key new features:

- An SDMX interface that allows direct import of data to be presented in the tool. This gives seamless access to the entire OECD Regional database on the data warehouse "OECD.Stat" via an SDMX web service, as well as to any other database supporting SDMX. SDMX is the world standard for exchange and sharing of statistical data and metadata, recommended by the UN Statistical Commission as the preferred standard (see SDMX). It is already implemented in the information systems of many

organizations, and many more are coming. This feature enables users to explore data of their own choice and integrate information coming from different sources. This feature is, therefore, of particular interest to regional policy-makers who will be able to drill-down the information on specific topics or on their own country, while using a common benchmark based on the OECD regional database. In the evaluation test preceding the release of OECD eXplorer, many users have welcomed this feature.

- Possibility to explore trends over time (yearly time series) for the indicators in the regional database (Section 6);
- Snapshot mechanism (Section 5) for presenting stories about the statistics embedded with interactive visualization and integrated into, for example, a HTML document structure.

The positive results of this project together with the ambition to develop a generic eXplorer platform have made NCVA a key partner of the OECD Global Project on "Measuring the Progress of Societies". A generic eXplorer platform would serve as the basis for the "Wiki4progress" project, which aims to become the catalyst of existing initiatives around the world on the measurement of progress of societies. Wiki4progress should represent the place where both experts and public could share their analysis and evaluations to raise awareness, inform and get informed through statistical information and storytelling based on solid evidence.

8. Acknowledgements

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