

Visualizing the Impact of Pollution on Public Health

Monitoring Atmospheric Pollution to Improve Public Health

Integrytis is a French consulting and data intelligence, business intelligence, and client relationship management services company with extensive experience in Big Data solutions.

They provide an innovative Big Data platform, called EPOD, that correlates business data together and displays them in a map together with time. This platform was recently used to visualize the impact of pollution on public health in real time, using a map, rather than by using lists and tables.



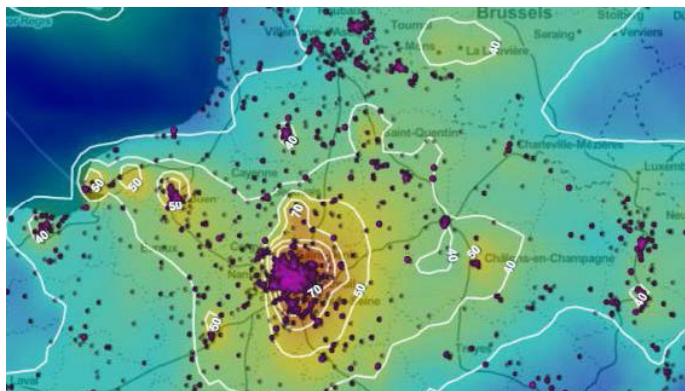
Geospatial capabilities put the data on the map

EPOD lets you aggregate together multiple data sources, coming from various sources and domains. Using the real-time visualization solution from the Luciad Portfolio of Hexagon's Geospatial division, those data can be geographically displayed on maps in real time. This provides a geospatial representation of data that allows citizens and health organizations to easily see on a map the impact of specific health issues across their country. This visualization technique has set the company apart from its competitors.

"It is this concept that makes the difference," explains Dominique Costardi, Co-manager of Integrytis and one of the two founders of the company in 2006, along with Ilias Bensaid. "We have opted for the geospatial representation of our data, which adds a real 'wow' factor for our customers and prospects!"

Visualizing the connection between air pollution and public health

The first customer to leverage EPOD's capabilities was a French Mutual health company with nearly 1.5 million members that provided anonymized mutual insurance data.

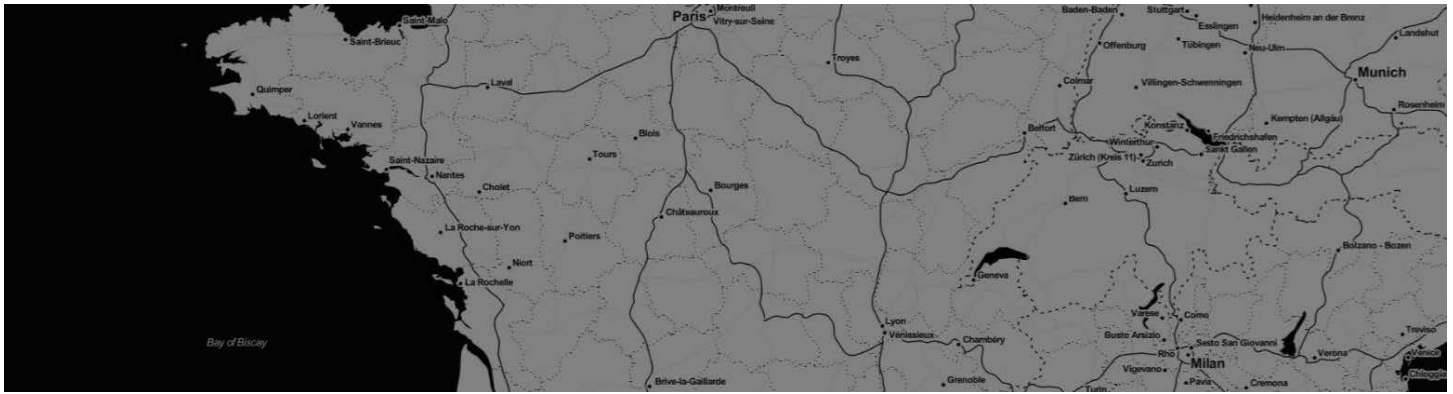


When the project was initiated in December 2016, France was experiencing an unusual pollution peak with cold weather and windless conditions that seemed to trap everything from exhaust fumes to industrial pollutants.

Unfortunately, air pollution has become one of the biggest environmental risks to public health in Europe, but governments are having trouble adequately dealing with the crisis. According to the study, "Cost of Air Pollution to France," by the Department of the Commissioner-General for Sustainable Development, the cost of respiratory diseases in France to the health system — doctor's appointments, medication, hospitalization, and so forth — is estimated at between 1 and 1.7 billion euros per year.

With the company's goal of providing analysis tools that enable a better understanding of the challenges at hand, Dominique Costardi correlated data from the Mutual company on respiratory diseases with data from additional sources. These sources included air quality data (such as nitrogen dioxide, ozone, and microparticles pollution), weather data, and data on wind patterns, from the French National Institute for Industrial Environment and Risks (Ineris).

“The Mutual health company wanted help in exploiting their enormous quantity of data, in particular on the conditions that affected its members,” explains Dominique Costardi. “Our platform already incorporated the open data on pollution in France that was compiled by the Official Air Quality Monitoring Associations (AASQA), including Airparif in the Paris region.”



Viewing the true impact of atmospheric pollution

With EPOD, the Mutual health company can see the true impact of atmospheric pollution on respiratory diseases over time, in real time (day-by-day or even hour-by-hour) and for every region in France. And thanks to its 403,170 sensor measurements, EPOD visualizes pollution in high resolution. With so many sensors providing detailed data, you can zoom into the map down to the 2-kilometer (1.2 mile) level to see the differences in pollution amounts from one street to another.

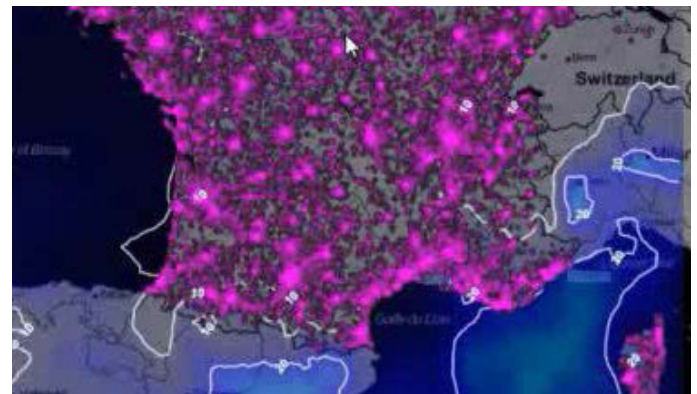
“With LuciadFusion server-side and LuciadRIA browser-side solutions, we can use our mapping system to zoom in on buildings and even on specific street numbers, but we have to ensure that the data remains anonymous in order to comply with the European regulation on data protection (GDPR),” says Dominique Costardi.

Predicting the next pollution impact

Integrytis intends to take EPOD even further so that their customers such as health companies can use predictive modeling. Predicting the impact of pollution on medical prescriptions for asthma attacks, for example, could increase the effectiveness of prevention campaigns by enabling advance warning to populations affected by a peak in pollution. Another use case is to exploit the platform to identify excessive use and/or sale of medications to detect cases of insurance frauds.

In addition, Integrytis and Hexagon plan to offer open access to anyone who wants to obtain information on pollution levels in France by consulting the history, or even by viewing the forecast for the coming days using the weather propagation model set-up with Ineris.

“We would also eventually like to add flu and pollen data, and to create an Open EPOD platform that is capable of displaying the spread of a flu epidemic, for example, in real time, with all the instant geospatial visualizations that the Luciad Portfolio solutions offer,” concludes Dominique Costardi.



Contact us

For more information, please contact us at:



marketing.us.gsp@hexagon.com



+1 877 463 7327



<https://go.hexagongeospatial.com/contact-us-today>



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Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon's Geospatial division creates solutions that deliver a 5D smart digital reality with insight into what was, what is, what could be, what should be, and ultimately, what will be.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 4.3bn USD. Learn more at hexagon.com and follow us @HexagonAB.

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