

Internet Publication of Network Statements

– Geo-enabled web service applications based on GeoXtension –

Deutsche Bahn AG (German Rail)

In connection with the implementation of an EU directive, rail network operators have to publish network statements on the internet, including relevant information on the access to the infrastructure.

FICHTNER CONSULTING & IT (FCIT) has developed a solution for DB Netz AG, integrating and publishing all relevant route data and enabling interactive analyses and thematic evaluations.

At the solution's core is GeoXtension – a product designed by FCIT to integrate geodata in business workflows via standard browser interface, requiring no additional software installation. The underlying state-of-the-art 3-tier application server architecture is based on an open standardized ORACLE spatial database.

Customer

DB Netz AG is the infrastructure manager of German Rail, responsible for the operation and maintenance of the railway network. Their prime objective is to ensure safe and reliable operation on the more than 35,000 kilometers of routes in Germany.

Situation

The EU has issued a directive intended to ensure indiscriminate access to the European rail network. According to this directive railway infrastructure managers have to publish the properties of their routes on the internet in the form of network statements.

In order to meet this directive, DB Systems GmbH assigned FCIT to implement a map representation of their route network on the web site of the DB AG.

Network statements on the web site of the DB AG

The network statements contain all relevant information on rail network utilization. When login-on to http://snb-prod.bahn.de/SNBViewer/public_html_de/index.html, railway companies can retrieve information on the railway network of the DB Netz AG.

The web site provides both a textual component and a comfortable, interactive map view of the railway network implemented by FCIT within the context of this project.



The screenshot shows a web browser window displaying the DB Netz AG website. The main part of the screen shows a map of the railway network with various lines and stations. A legend on the left side of the map provides information about the different types of lines and stations. Below the map, there is a detailed view of a specific section of the network, titled 'Streckenabschnitt Großkorbetha Leipzig-Leutzsch'. This view lists various technical specifications for this section, such as track class, speed, and signaling.

Streckenabschnitt	
Großkorbetha Leipzig-Leutzsch	
KV-Kodifizierung	P/C 410
Streckenklasse	CM4
Lichttraumprofil	mit Einschränkung
Gleisanzahl	mehrgleisig
Zugbeeinflussung Punkt	mit PZB
Zugbeeinflussung Linie	ohne LZB
NetTech Fernverkehr	ausgerüstet
NetTech Nahverkehr	nicht ausgerüstet
Streckenneigung	< 20 Promille
VZG-Geschwindigkeit	bis 120 km/h
Oberstromgrenzwert	600 A
Kommunikationssystem	analoger Zugfunk
Traktionsart	Oberleitung
Streckenöffnungszeiten	ohne Einschränkungen

Display of information on a certain section

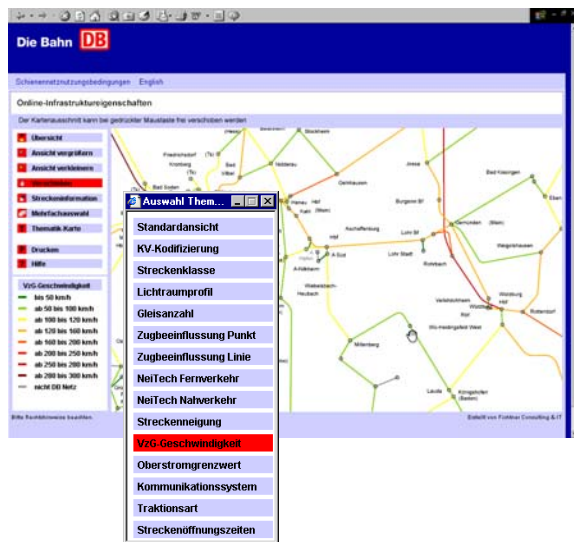
Graphical infrastructure information

The application implemented by FCIT enables clients to navigate in a map of the railway network and directly retrieve pre-defined information on specific sections. Easily and promptly, potential users of certain sections obtain information on permitted speed, load capacity, communication equipment, clearance and other critical section characteristics. Via a semi-automatic multi-selection, users can view all properties of a complete route in list form.

Thematic maps are generated upon a mouse click. Selected route properties are highlighted and concisely displayed. Properties such as section class or speed can be identified at a glance.

The application is highly interactive, providing tool tips, dynamic highlight functions and distinct command redlines. Even untrained users can operate it intuitively.

The subject solution constitutes one of the most comfortable and state-of-the-art implementations of the EU directive on network statements.



Thematic map on the locally permitted speed

Implementation

The solution is based on FCIT's GeoXtension web service components. These components are already enhancing a number of business process workflows at German Rail.

FCIT has designed the overall architecture and supported DB Netz in integrating the data, including creation and configuration of the GeoXtension web component.

GeoXtension

GeoXtension is deployed on ORACLE's Application Server based on data from an OpenGIS® warehouse. This technology allows GIS data to be integrated with other German Rail or third-party data, thus creating valuable decision support and allowing navigation and queries based on the intuitive map display.

GeoXtension has been developed in the leading web architecture J2EE, allowing cost-effective and manageable integration of valuable geodata with other enterprise systems such as ERP, CRM, Billing, Dispatching and others.

GeoXtension takes advantage of leading standards to protect investment and allow a wide range of standard tools to be utilized. The geodata are displayed in the W3C®-XML definition SVG (scalable vector graphics). The base data are kept in OpenGIS® *Simple Feature Specification* format. The application server architecture ensures maximum scalability in terms of end user numbers, data volumes and system distribution.

This helps boost the efficiency of geo-related business processes via web service enterprise applications – from small installations with only a limited number of users up to full-scale professional internet services.

Outlook

The standard technology can be upgraded any time, adding data and/or convenient functions, for example routing queries for the shortest and/or fastest connection between two stations with specified properties (e.g. specific clearance profiles or communication equipment).

The open architecture also allows direct integration of the system into the section portal of the DB Netz AG. After entering their start and target station, clients can select one of the authorized sections displayed in the map and order it directly from the DB Netz AG.