
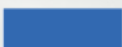


KENDOX


 Kanton Zug

TIEFBAUAMT ZUG

CASE STUDY

Date 20.09.2022

Civil Engineering Office of the Canton of Zug

Flexible online access to document and multimedia archive with attached geodata

The Civil Engineering Office of the Swiss Canton of Zug, an office of the Department of Planning, is responsible for planning, building and maintaining the canton's road network. Its other responsibilities involve hydraulic engineering, traffic engineering and construction regulations. With the development and adoption of the georeferenced document management system Kendox InfoShare, the Civil Engineering Office has established an open solution that offers great potential for use by other industries. Using geometric data, the office can search for and display contracts, plans, photographs and other documents on an interactive map which also exists as an app. Documents, photos and videos created on-site can also be located and archived directly within the system..

- Customer**
- Civil Engineering Office of the Canton of Zug
 - 70 employees
 - Approx. 150 construction and maintenance projects per year
 - Approx. 25 million CHF in capital expenditure per year
- Industry** Local authority
- Project**
- Expand the existing Kendox InfoShare system
 - Attach geodata to civil engineering documents
 - Display on an interactive map
 - Approximately 150,000 documents in the archive (which continues to grow)
- Requirements**
- Attach geodata to documents
 - Search documents on map using geometric data
 - Visualise geometric data
 - Display location of captured images and video
 - App-based mobile access to data and documents



The Civil Engineering Office of the Canton of Zug and its approximately 70 employees support around 150 construction and maintenance projects every year. Construction sites need to be visited, logs filled in, and reports created – and each one linked to a given construction project or location. Having straightforward, mobile access to the organisation's over 150,000 documents via their associated geodata means that transparency is improved and day-to-day work becomes much easier. As part of the digitisation project, Pit Bühler, Head of Change Management and Finance Controlling at the Civil Engineering Office, worked together with his IT team and Kendox to modernise and expand the existing document management system (DMS) to include a broader range of usage options and functionality. The result was a document and multimedia archive with attached geodata that employees and business partners could access from anywhere using an app.

WANTED: INTUITIVE DOCUMENT SEARCH

As a long-term Kendox customer, the Civil Engineering Office in Zug has used Kendox InfoShare for document archiving and management for many years. The archived documents include project-related materials like blueprints, images and videos as well as associated invoices, quotations and reports.

It is estimated that more than 70 per cent of the documents managed this way contain georeferences for specific "sites" (construction sites, bodies of water, roads within the canton, cycle paths, lamp posts, etc.) Previously, documents within the DMS could only be searched based on their metadata, such as the attached infrastructure data, a specific address, a street number, a project number and so on. There were only limited ways to find contextually relevant information (for example, to ask "What's nearby?").

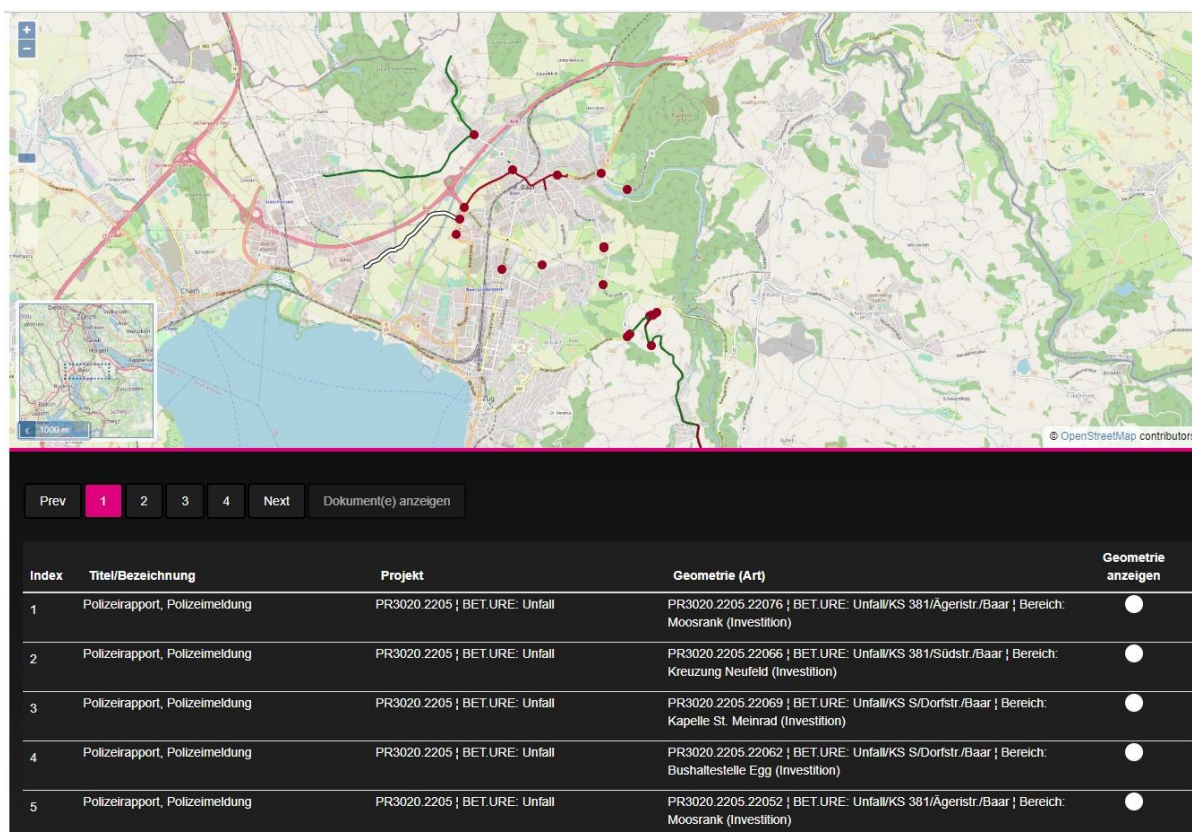
The Civil Engineering Office works very intensely with GIS-based specialist applications. In many cases, searching with a map would have been much more intuitive than searching by address or other document metadata. However, it was not possible for the many GIS applications to directly access documents in the DMS. Users had to leave the GIS application and search through the DMS (sometimes repeatedly).

CONNECTING DOCUMENTS AND LOCATIONS

During the digitisation process, it became clear that it was essential to make documents searchable based on geometric and attribute data. Assigning the vast majority of construction site documents, images and videos to specific projects and their location would make them much easier to find in future. Bringing together the geodata with the very structured information managed in InfoShare would bring significant benefits. If documents could also be easily searched using a map visualisation, this would be much more intuitive for users and provide greater transparency of contextual information. Information would also be easier to find, especially if it did not contain specific search parameters like an exact address.

Bühler and his team developed a solution concept with the essential basic requirements. This included displaying the geometric information linked to a document (e.g. for construction sites), as well as the ability to search based on geometric data and to flexibly place documents on a map.

"We saw the potential and the scope for innovation in Kendox InfoShare by the nature of its constant ongoing development," Bühler says. "That convinced us that it was the right solution."



| Index | Titel/Bezeichnung | Projekt | Geometrie (Art) | Geometrie anzeigen |
|-------|--------------------------------|-------------------------------|---|-----------------------|
| 1 | Polizeirapport, Polizeimeldung | PR3020.2205 ; BET.URE: Unfall | PR3020.2205.22076 ; BET.URE: Unfall/KS 381/Ägerstr./Baar ; Bereich: Moosrank (Investition) | <input type="radio"/> |
| 2 | Polizeirapport, Polizeimeldung | PR3020.2205 ; BET.URE: Unfall | PR3020.2205.22066 ; BET.URE: Unfall/KS 381/Südstr./Baar ; Bereich: Kreuzung Neufeld (Investition) | <input type="radio"/> |
| 3 | Polizeirapport, Polizeimeldung | PR3020.2205 ; BET.URE: Unfall | PR3020.2205.22069 ; BET.URE: Unfall/KS S/Dorfstr./Baar ; Bereich: Kapelle St. Meinrad (Investition) | <input type="radio"/> |
| 4 | Polizeirapport, Polizeimeldung | PR3020.2205 ; BET.URE: Unfall | PR3020.2205.22062 ; BET.URE: Unfall/KS S/Dorfstr./Baar ; Bereich: Bushaltestelle Egg (Investition) | <input type="radio"/> |
| 5 | Polizeirapport, Polizeimeldung | PR3020.2205 ; BET.URE: Unfall | PR3020.2205.22052 ; BET.URE: Unfall/KS 381/Ägerstr./Baar ; Bereich: Moosrank (Investition) | <input type="radio"/> |

“The InfoShare Client for the Civil Engineering Office can work with GIS data. To that end, we added geometric data to the roughly 80,000 documents already in the system.” - Harald Thönig, project lead, Kendox

FROM CONCEPT TO PROTOTYPE

Together with Kendox, the Civil Engineering Office developed a proof of concept for linking projects' and structures' geometry to specific documents. Based on the solution requirements and the implementation concept, Kendox then put together a prototype to test the feasibility and potential of such a solution.

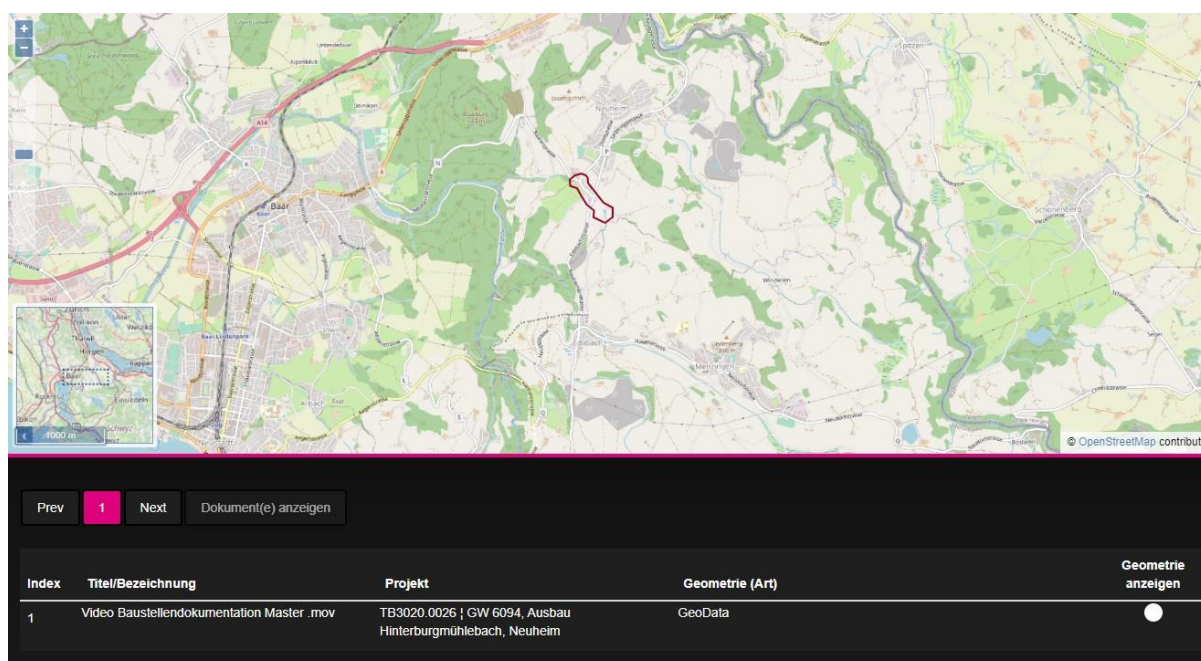
This proved very promising, and so the order was given for the full concept to be developed. Kendox worked on this concept in an agile project environment. Together with project lead Bühler and his colleague responsible for GIS, Willi Zeltner, they optimised the concept and continued to work on it.

Kendox's project lead, Harald Thönig, explains the approach: “We built a brand-new InfoShare search client for the Civil Engineering Office which can also work with geometric data (also known as GIS data). To that end, we added geometric data to the roughly 80,000 documents already in the Kendox archive. Meanwhile, geometric data relating to new projects and construction sites was added to the DMS every day.”

THE RESULT: MULTI-LAYERED GEODATA CONNECTIONS

The approach to displaying documents' geometric data on a map has been thought through as carefully as possible. Each document saved to InfoShare has a range of associated metadata, like the project name, local authority, street, construction site, cycle lane number, and so on. In parallel with this, the Civil Engineering Office holds the geometric data for each object. This data can be added to the document – which could be images or videos, invoices, quotations, reports or other files. The geometric data can then be visualised on an in-app map.

Users can mark documents in InfoShare and view their associated geometric data. They can also see which documents are associated with a given area by looking at the map. Images and videos taken on-site are assigned the correct geometric data using automatically captured GPS coordinates.



EXPANDING TO BECOME AN INTERACTIVE MULTIMEDIA ARCHIVE

Search queries can be sent from any GIS tool using a map view in InfoShare. When searching for a document using the app, users can not only select a map region or point, but also use filter criteria like the document type, date and more. This will return all documents whose geometric data lies within the selected map region that also meet the filter criteria.

Users can use this to view all documents associated with a specific site or property, or search within a defined area of the map for specific types of structure (e.g. traffic lights, bridges, etc.) They can also search by document type, for example to find police reports, blueprints or photographs associated with a structure or property.

A MODERN GIS TOOL WITH HIGH USER VALUE

Thanks to this project with Kendox, the Civil Engineering Office now has a new way to use its existing DMS based on geoinformatics. This specialist application is efficient and user-friendly, saving employees a great deal of time when working with documents. It is also highly expandable, since its architecture is based on web technology. In future, search terms may be submitted via a range of GIS tools (such as QGIS, OpenStreetMap,

OpenLayers, Google Maps or EU INSPIRE) or location-based apps, simply by sending a geographical search query to Kendox InfoShare.

The tool has already established itself among the user base and sees use by a wide range of departments across the whole of the Civil Engineering Office (e.g. for geographic searches for plans, contracts and inspection reports) and is more generally used to store infrastructure-related documents with associated location data (civil engineering works, technical facilities, etc.)



FUTURE EXPANSION PLANNED

There are already plans for the tool to be expanded in future. Change Manager Pit Bühler would like to see the DMS evolve further into a collaboration platform, enabling documents to be exchanged between internal and external stakeholders. Other specialist applications should be integrated as needed, ensuring that documents are assigned attributes as meaningfully and efficiently as possible. Alongside the continuing evolution of the DMS, the goal is also to introduce and enable new functionality bit by bit, such as digital signatures.

Kendox project lead Harald Thönig is likewise pleased with the outcome of the project: "Together with the Civil Engineering Office, we have realised a holistic tool with a high user value. It started with nothing more than a vision of searching for documents based on their geometric data. The rest came together in the course of our agile collaboration on the project." Pit Bühler is looking forward confidently to future requirements: "The solution that now exists has opened the way to integrating with other departments in the canton's government."

"We are very satisfied. Experience, quick communication and goal-oriented thinking convinced us of the value of working with Kendox."

Pit Bühler

ABOUT KENDOX

Kendox are the experts in digital document management and process automation for offices and administrative bureaus. With years of experience providing solutions using its own in-house technology, Kendox works in particular with customers in industry and manufacturing, trade and e-commerce, services, and logistics as well as with public institutions, schools and universities.

Kendox's applications are supplied and operated in the cloud from the company's own virtual data centres in Germany and Switzerland. Its software solutions are based on forward-looking technologies and meet today's security and data protection requirements.

Kendox's document and process automation solutions integrate with Microsoft 365, leading ERP solutions and many other specialist applications. Thanks to Kendox's collaboration with other solution providers and integration partners, the Kendox software platform works in any number of diverse use cases.

Kendox AG is based in Oberriet, Switzerland. Branch offices, as well as sales and consultancy offices, are located in Oberhausen, Germany; Vienna, Austria; and other locations in Germany, Austria and Switzerland. Together with its partner network, Kendox provides ongoing support to over one thousand customers.

Kendox AG

Bahnhof-Strasse 7
9463 Oberriet SG
Schweiz
T +41 (71) 552 34 00

Kendox GmbH

Paul-Reusch-Straße 2
46045 Oberhausen
Deutschland
T +49 (208) 77 89 28 00

Kendox AG, Niederlassung Österreich

Favoritenstraße 87/2
1100 Wien
Österreich
T +43 (720) 27 34 20

DM Dokumenten Management GmbH

Dornierstraße 4
82178 Puchheim
Deutschland
T +49 (89) 80 06 13 0

DM Dokumenten Management GmbH, Niederlassung Serbien

Svetozara Markovića 78
34000 Kragujevac
Serbien
T +381 (34) 373 73 35