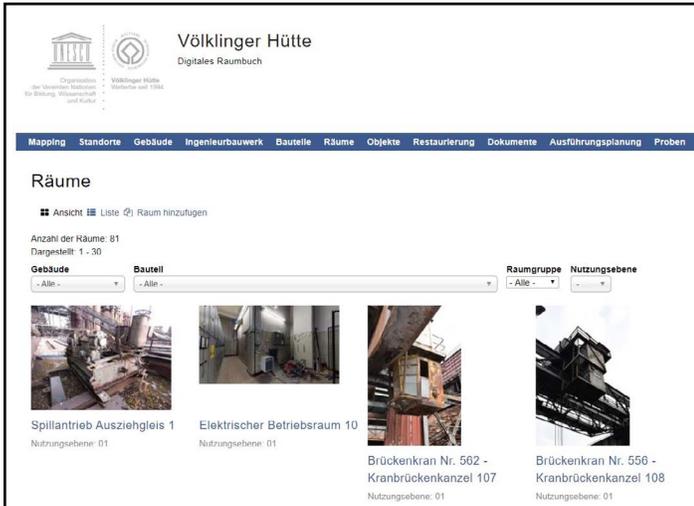
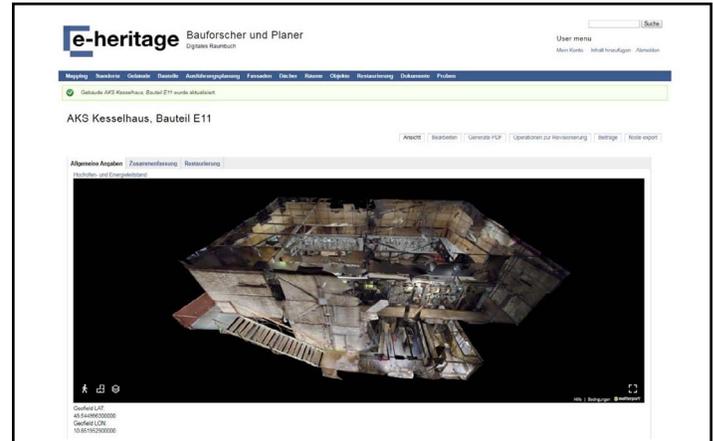


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Listing of rooms in World Heritage Site Voelklinger-Huette



3D model embedded into e-heritage as a 'dollhouse' view.

E-HERITAGE WEB APP FOR DOCUMENTATION

Kornelius Götz, conservation Industrial Heritage consultant, and Sofia Vargas-Koch, Master Architect, Drupal Consultant

Reports are part of the everyday tasks in the documentation of industrial heritage. Microsoft's Word is often used for this purpose and digital photos are inserted into it. The result is printed or saved as a PDF document. This is simple but has decisive disadvantages.

Now it is time for an alternative, the development of a web application. Unlike classic word processing programs, web applications are not installed on the local computer at home. The data processing takes place on a web server. The results of the data processing are transferred to the user's local computer where they can be viewed and evaluated.

The web application 'e-heritage' was developed especially for documenting Industrial Heritage. Two things were very important: First, users with different levels of experience should be able to start working immediately. Secondly, everything should be intuitive to use. E-heritage was programmed with the open source software Drupal, which is used worldwide.

To start e-heritage, open <https://e-heritage.eu/en/content/test-e-heritage-planner-30-days> in your web browser. Any browser can be used. The site is available in three languages: German, Eng-

lish and Spanish. After logging in, documentation can be started directly by clicking on "add content".

For each project there are different templates for buildings, rooms, inventory, damage and diagnosis and for the documentation of conservation. The templates serve as a checklist for the creation of the inventory and damage recording and are derived from two European standards BS EN 16095:2012 and BS EN 16096:2012 (see below).

In addition to texts and images, scans of former resources, PDF documents, drawings, plans, videos and sound files, GIS information and zip files can all be integrated into the recording templates.

Once everything is uploaded and saved, the documentation is permanently available in the cloud. Loss or damage to your own computer can no longer affect the documentation. The data is available around the clock and periodic backups of the data are performed in the background.

Beside security, the cloud also offers other advantages. Different users at different locations can work together in one project. At the same time, everyone has access to the same level of information, which is particularly important for large projects with many different participants.

3D models and e-heritage

Three-dimensional virtual tours are currently changing everything. Google Street View, for example, is one of the most popular apps among others. Industrial Heritage is often very complex, with many rooms full of inventory. Spaces are often so small and cramped or so overcrowded that a photograph cannot show everything. With a three-dimensional camera, the heritage can be captured very easily and quickly on site and can be explored by a virtual tour at home.

The decisive factor here is that the technology is easy to use,

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which is now fulfilled, for example, by the scanner system from Matterport ©. The operation is as simple as with a conventional digital camera and the costs are also moderate. In contrast to a digital photo, however, a real 3D model with floor plan, virtual tour with high-resolution pictures and a 3D view (dollhouse) is created.

In e-heritage, the 3D models from Matterport © are integrated just as easily as a photo. The decisive difference is of course the great clarity. Furthermore, these models can be measured on screen with an accuracy of a few centimetres.

Oral History

In the context of industrial heritage there are very often still experts available who used to work here in the past. These experts have invaluable detailed knowledge which should also be documented and preserved for future generations.

This is easily possible: today every smart phone has an app for recording videos. Digital cameras provide the same service in higher quality. That's why e-heritage offers the possibility to insert videos. Furthermore, the videos can be linked to the 3D model. Ideally the expert stands at his former workplace and explains who he is and what he has done there, pointing to the inventory while the video is being recorded.

Large scale example: Voelklinger Huette

The web application e-heritage is in use for recording the inventory and conservation planning at this World Heritage Site since the beginning of 2018. In this project, 81 rooms in 53 buildings have been recorded and linked to over 600 individual ob-

jects. In addition, 19 central locations have been captured using 3D models and linked to e-heritage. The specifications were created directly from e-heritage via export files. Currently the conservation services are carried out on site. The documentation of the conservation as well as the process of procurement is done online by e-heritage.

A comparison with similarly large projects from the past shows that planning and documentation of a project is more accurate and clearer and is much faster than with the conventional methods.

- In conclusion, we can say that e-heritage offers these advantages:
- easy recording of information;
- the checklist in the templates follows EN 16095:2012 and EN 16096:2012;
- upload of many data formats;
- highly vivid through integration of 3D models and videos;
- data security and cooperation of different participants at different locations;
- information can be imported and exported via exchange formats;
- runs on mobile devices such as smartphone, tablet or notebook.

Quoted standards: Conservation of cultural property — Condition recording for movable cultural heritage, BS EN 16095:2012. Conservation of cultural property — Condition survey and report of built cultural heritage, BS EN 16096:2012.

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INDIA

THE LEGACY OF KOLKATA TRAMS

Deepesh Sangtani and Syed Mohammad Hamza Abdulah

The introduction of railways into the formation of Kolkata as a compact industrial city plays a pivotal role in understanding the legacy of trams in the erstwhile British capital of India. The industrial revolution overwhelmingly altered the urban fabric of many cities, including Kolkata. And the availability of raw materials and agricultural resources facilitated the establishment of ports and

factories, the transportation of which would require an efficient transit system.

Consequently, railways, waterways, and tramways were introduced in the city by the British. The first horse-driven tramcar ran on 24th February 1873 between Sealdah and Armenian Ghat Street, but it was disbanded shortly after. Seven years later, trams as public transport on the streets of Kolkata were institutionalized through the formation of Calcutta Tramways Company or CTC. It was in 1902 when two of the first electric trams were introduced by the CTC originating between Esplanade and Khidderpore, and Esplanade and Kalighat stations.

Post-independence, Indian megacities continued to employ tramcars on their roads, but not all of them could forebear the increas-