

USING WORDPRESS AS A SIMPLE AND RELIABLE ELECTRONIC LOGBOOK FOR THE HEIDELBERG ION-BEAM THERAPY CENTRE (HIT) ACCELERATOR CONTROL SYSTEM

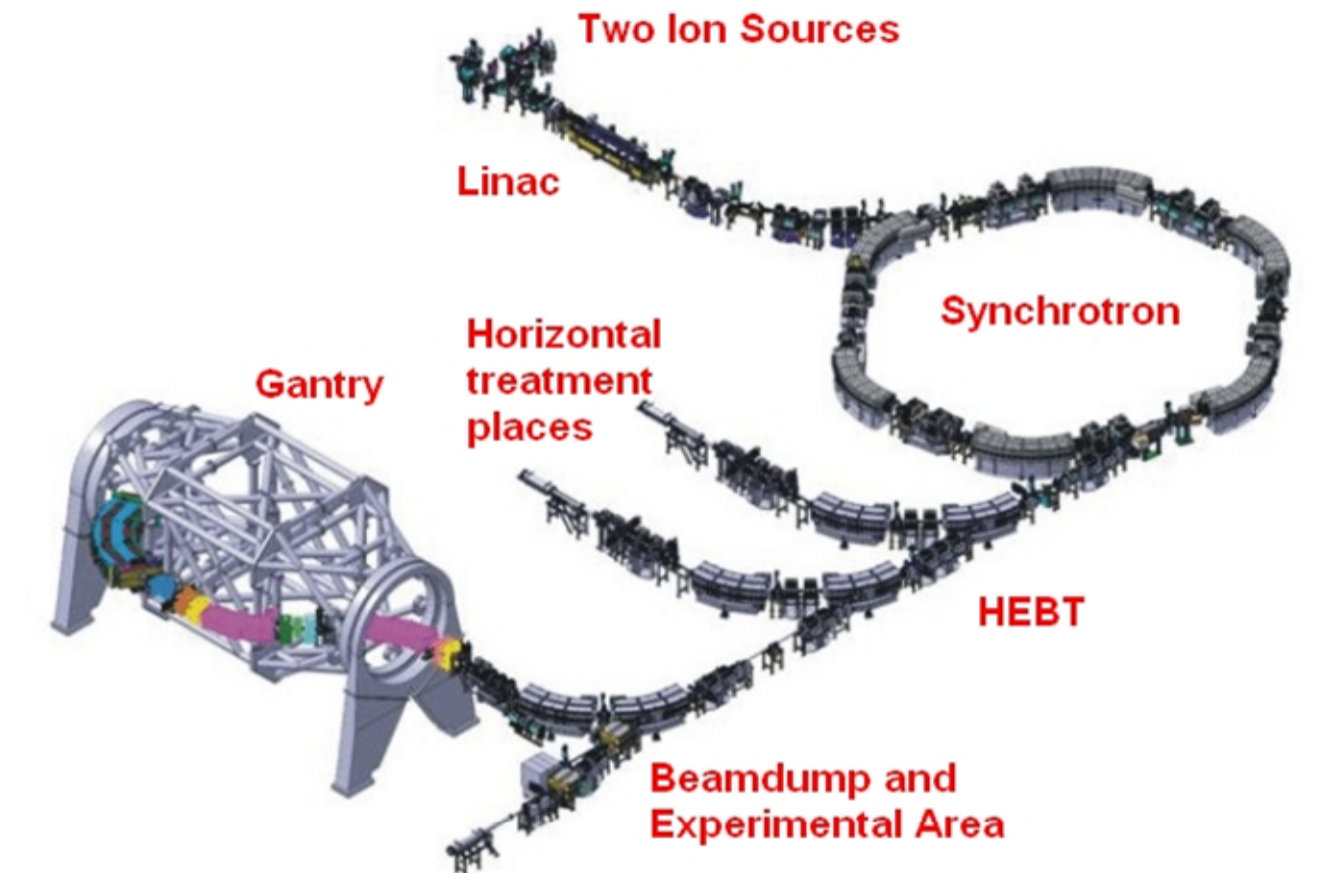
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Abstract

The HIT accelerator facility has used a web-based electronic logbook (elog) rather than other forms of logging since its commissioning. After the breakdown of a java/XML based electronic logbook (elog), the decision to use a more mature and reliable approach based on dynamic web and database technology was made. The target was to provide operators with a reliable and easily used system to record and discuss incidents during shifts, write error reports with screen shots and build and maintain a section of troubleshooting tips or “Frequently Asked Questions” (FAQs). Several systems were evaluated and the combination of PHP scripting and MySQL database, as well as the excellent community support with plugins, customizations and bugfixing of the free publishing platform Wordpress, lead to a test installation. This test installation was then customized with themes and plugins to accommodate as much of the wishes of the operators as possible. After several months of live testing in the control room and some tweaking of the used plugins and theme, the HIT-Elog is now accepted by the operators and used on a daily basis.

HIT Accelerator Facility

The Heidelberg Ion Therapy Centre (HIT) is a dedicated hadron accelerator facility for radio-therapeutical treatment of tumour patients. The two horizontally fixed treatment places as well as the experimental area can be served with proton and carbon beams with qualified beam parameters (MEFI), other ions like helium and oxygen have been tested. The achieved energy range of 88-430 MeV/u for carbon ions and 48-221 MeV/u for protons is sufficient to reach a penetration depth of 20-300 mm in water.



Parameter	Steps	Protons	Carbon
Energy	255	48-221 MeV/u	88-430 MeV/u
Focus	4 (6)	8 – 20 mm	4 – 12 mm
Intensity	10 (15)	$4 \cdot 10^8$ - $1 \cdot 10^{10}$ 1/s	$1 \cdot 10^7$ - $4 \cdot 10^8$ 1/s

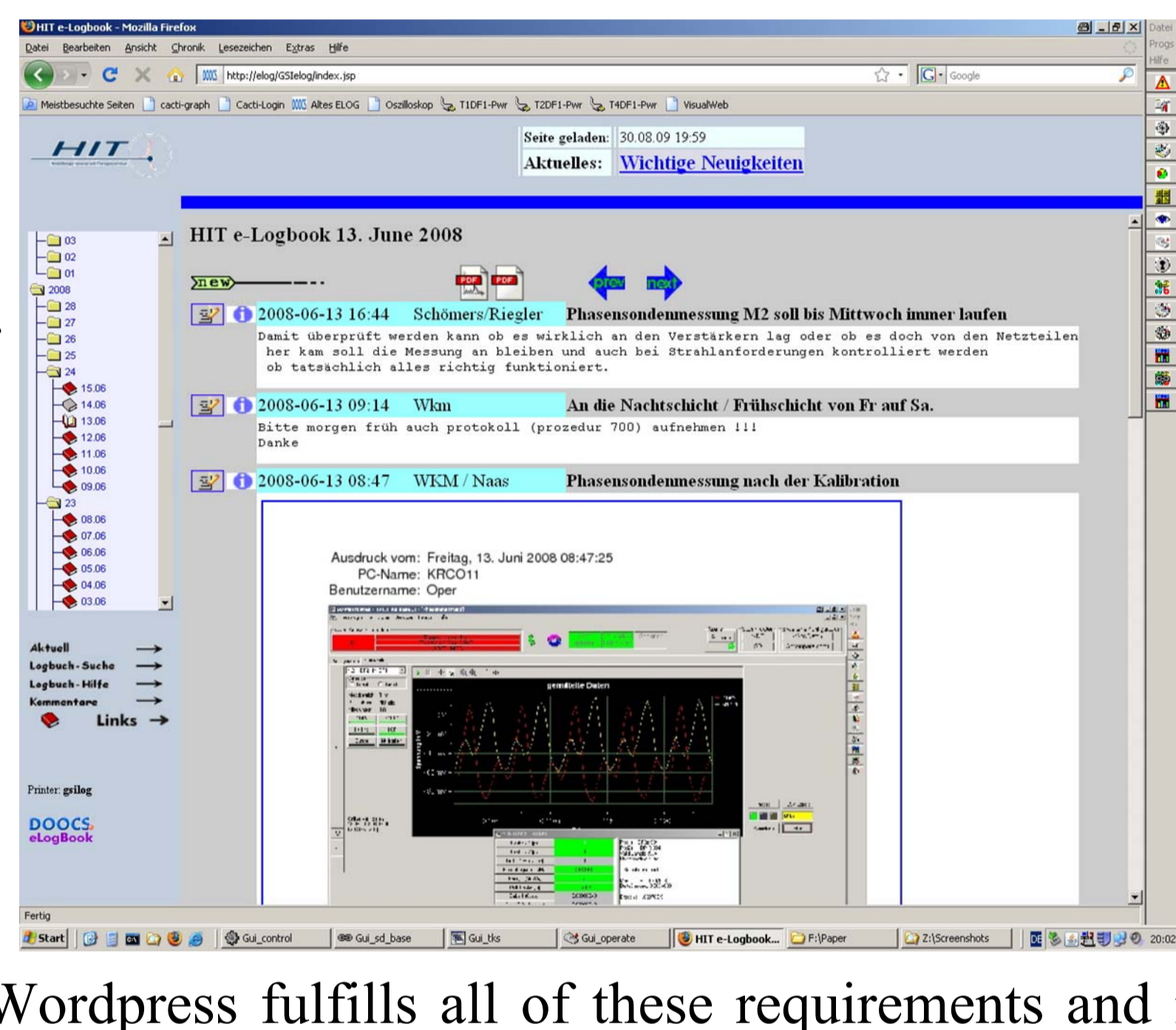
The first patient treatments are expected to commence in late 2009.

Finding a replacement for the eLogBook

During the early commissioning, a modified version of the DOOCS eLogBook was used, but in mid-2008 some critical functions in the java server, the elog uses, broke down. So a replacement had to be found.

Primary Requirements

- Flexibility
- Usability
- Performance
- Maintenance

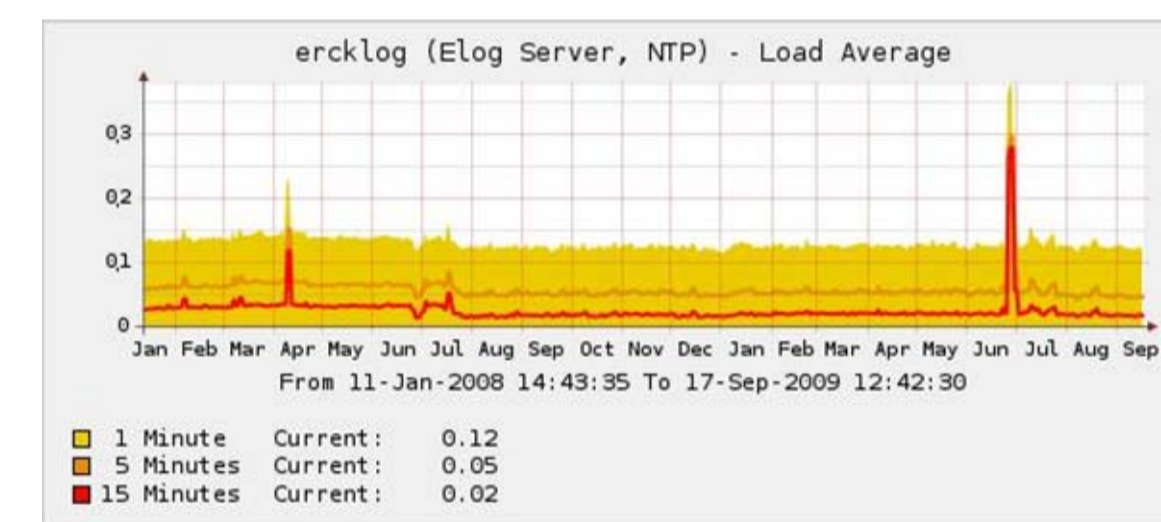


The free online publishing platform Wordpress fulfills all of these requirements and is based on stable and mature web technology.

Performance

Wordpress is based on a PHP script system using a MySQL database as storage.

All content is stored in indexed tables in the database and is displayed dynamically according to filtering options. As of now, over 800 posts in 52 categories have been written by 49 operators with almost 200 comments.



The server running the Elog is an industry standard 19” rack server with 1 GB of RAM and it has never exceeded a load average of 0.4 since running Wordpress

General Stats

Total Stats
 49 authors to this blog.
 838 posts were posted.
 12 pages were created.
 14 tags were created.
 188 comments were posted.
 30 different nicknames were represented in the comments.
 2 links were added.
 52 post categories were needed.
 1 link category was needed.

Flexibility

Wordpress can be customized with:

Themes/Layouts

> 900 Themes with lots of different layouts.

Plugins

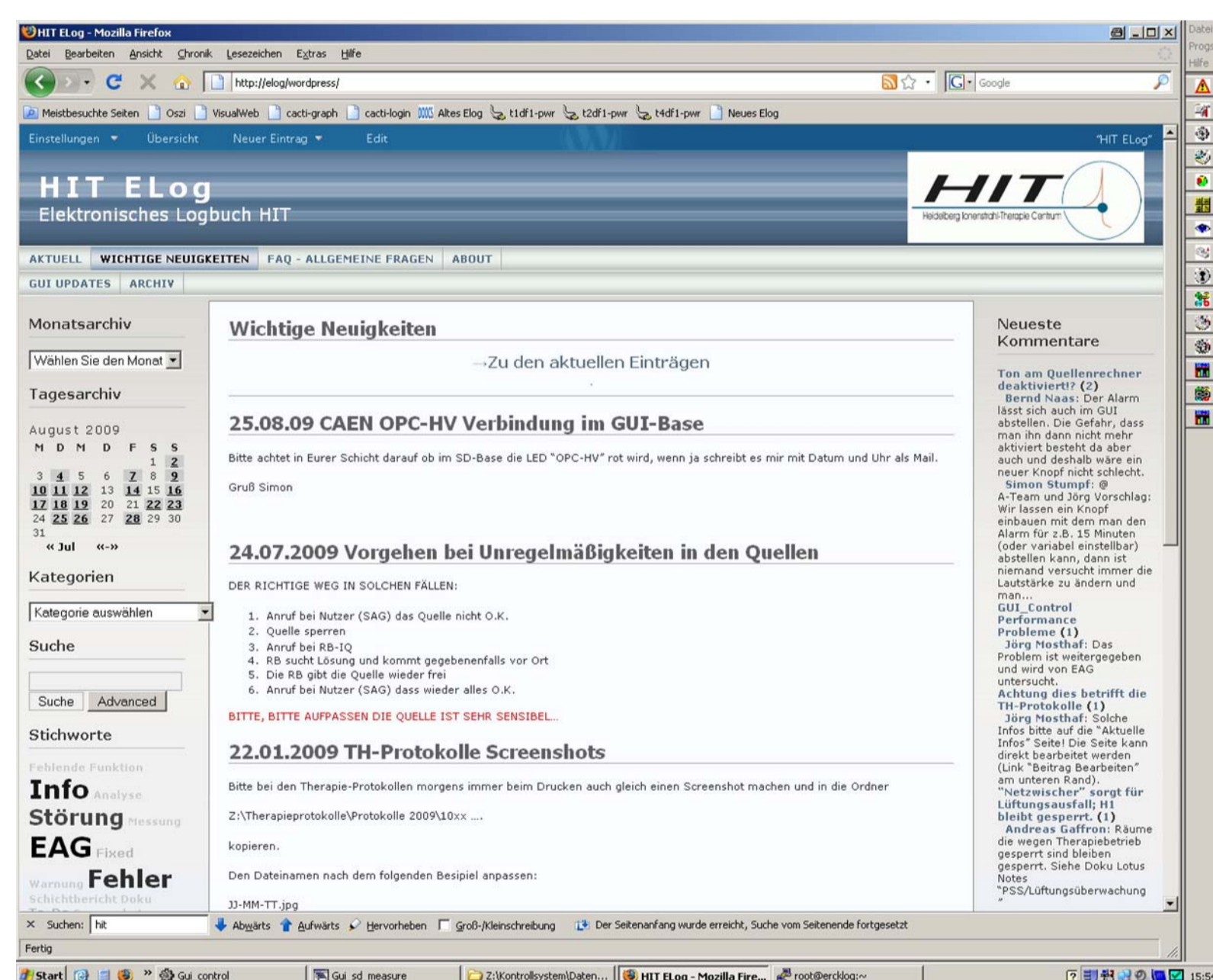
>6000 Plugins which provide functionalities like FAQs* or statistics or co-authors.

Themes and Plugins also provide

Widgets

Widgets are additional control items like a sidebar for recent comments or a calendar for daily or monthly archives. A customized Search field as well as a tag cloud are also examples of widgets used in the HIT elog.

* *Frequently Asked Questions*

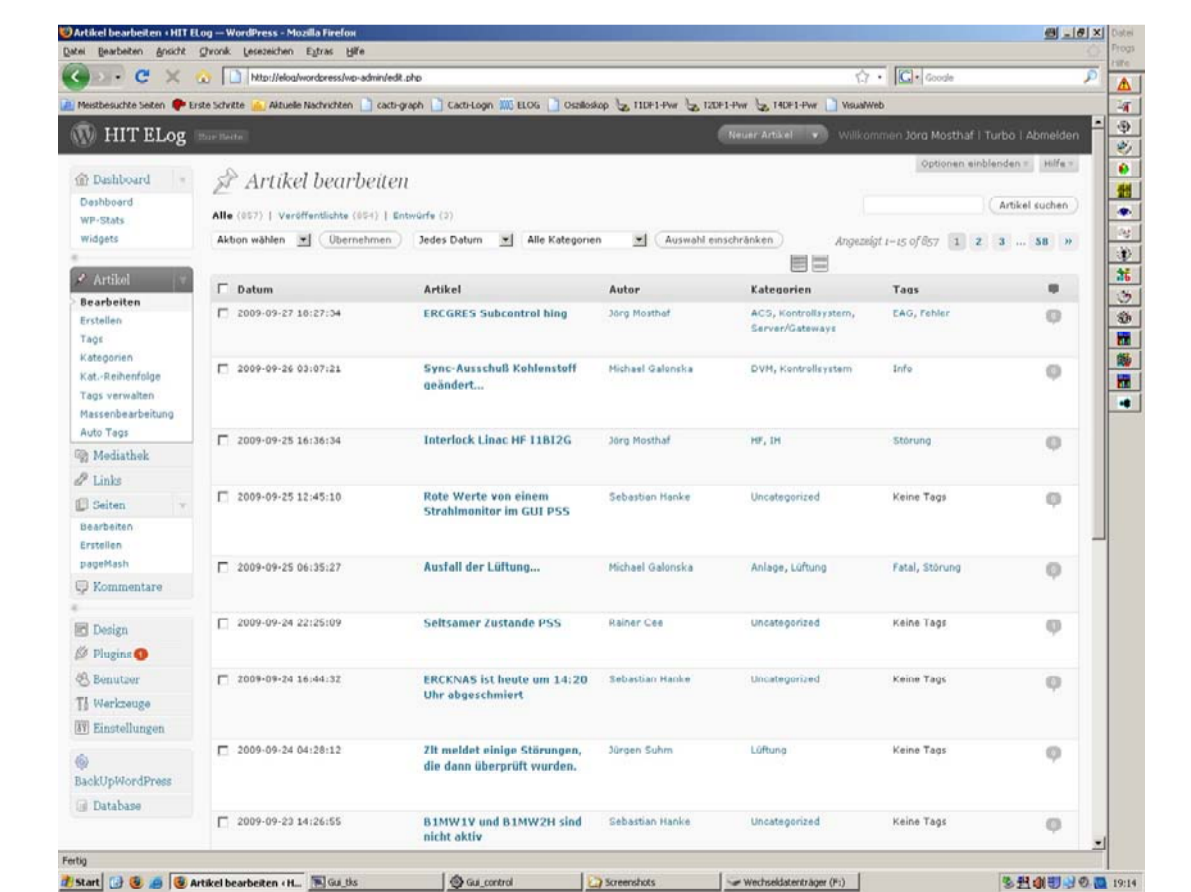
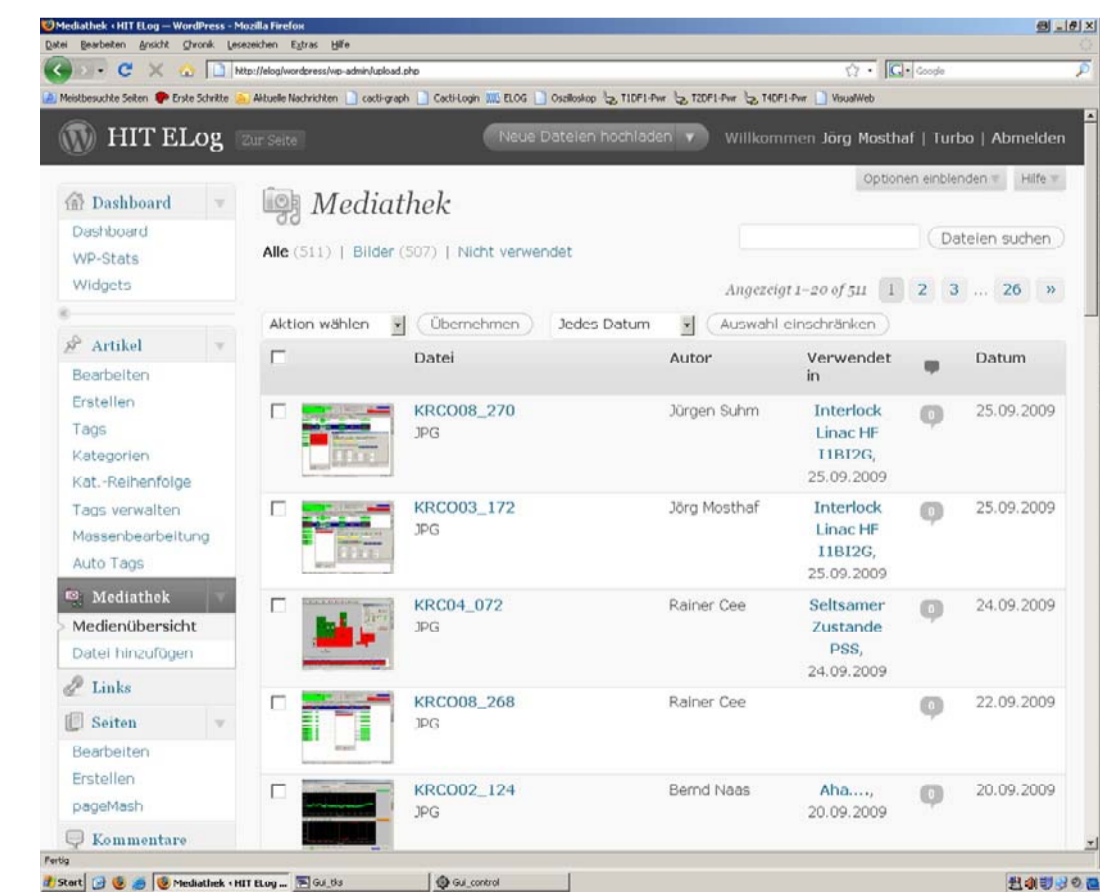


Maintenance

Wordpress comes with a variety of maintenance tools to help keeping the installation running fast and clean. The built-in media library helps in finding and deleting orphaned media files. The article overview page helps in finding posts without tags or categories and helps in correcting problems.

The “WPDBManager” plugin re-organizes and cleans the database in intervals and also allows backups of the database content.

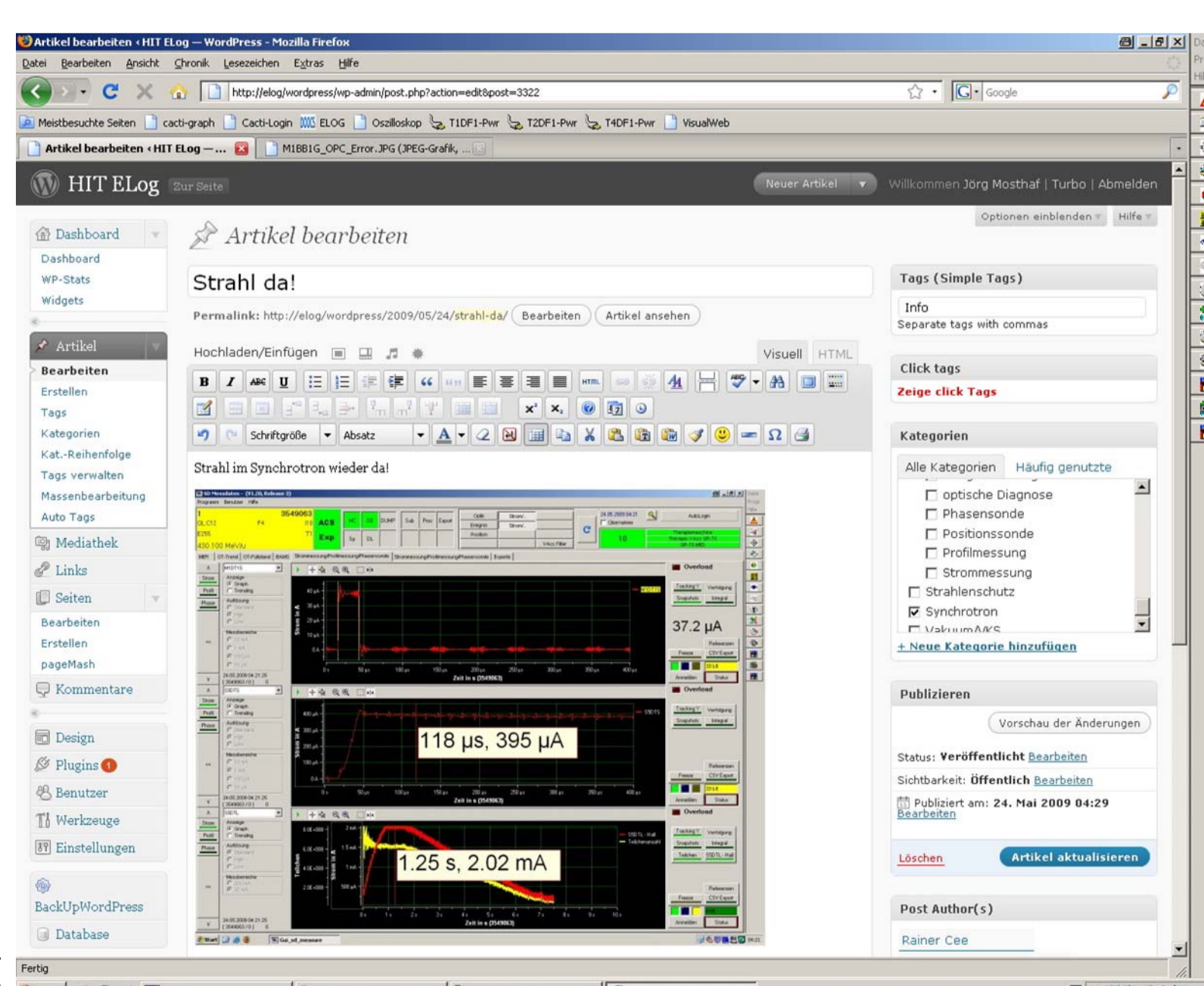
“Wordpress Backup” automatically does SQL- and full backups of all uploaded files and content and provides a simple interface to manage and restore backups.



Usability

The back end focuses on usability and speed and makes creating and editing posts very easy with its built-in WYSIWYG*-Editor. This Editor is similar to a word processor and allows easy uploading and embedding of image and other files.

A source code editor allows more precise control over the content. Widgets allow the operator to set the meta data of a post, including category, tags and multiple authors. A versioning system shows all changes of posts and allows restores. The layout of the editor page can be adjusted by dragging the elements to the desired location and hiding unwanted ones.



* *What You See Is What You Get*

Conclusion

After several months of testing in parallel with the DOOCS ELogBook it is clear, that an Elog based on the open source publication software Wordpress is a workable alternative to proprietary electronic logbooks. Most operators have accepted the new HIT-Elog and use it extensively. It was necessary to tweak the themes and use several plugins to get as close as possible to the DOOCS ELogBook. There are still some features that are difficult to get without custom made plugins, but some plugins are already in development, that provide similar features. Some features of Wordpress still cannot be used with the current network setup. E-mail notification of comments, FAQ requests and changes as well as posting articles by email are e.g. not possible without a dedicated mail server. Integration of accelerator data and statistics into automated shift reports is also planned for future developments. Wordpress, and with it the HIT-Elog, is still evolving fast to accommodate new needs and features.