E-LOGBOOK RELOADED OR THE RENOVATION OF DESY'S ELECTRONIC LOGBOOK

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Abstract

Heading towards the tenth anniversary of the DESYs electronic logbook, this paper outlines the various changes and improvements done to the electronic logbook since its first days. To satisfy and support the seeming never ending requests for copies of the electronic logbook from all over the world and to allow better maintainability, the original DESY e-logbook has undergone many changes. The manageability of several dozens of e-logbook instances at once triggered the development of the so called "E-logbook Manager" application. But also many smaller improvements like replacing the old fashion navigation tree by a modern AJAX driven one, a "mail to experts" tool to easily post problems/info's to responsible persons or secure access methods to allow access to the e-logbooks from all over the world, have been made in the last years. As a next step a redesign of the login and security concepts is under development and will be presented.

THE HISTORY OF THE DESY E-LOGBOOK

In 2001 the DOOCS team decided to develop an electronic version of the so far used paper based machine operations logbook. The main idea was to replace the up till now in costly handicraft created paper book logs, by using dynamic web pages to create and visualize the machine status.

The main ingredients for this initial version of the DESY electronic logbook, have been XML, XSL and Java servlets (see Fig. 1).

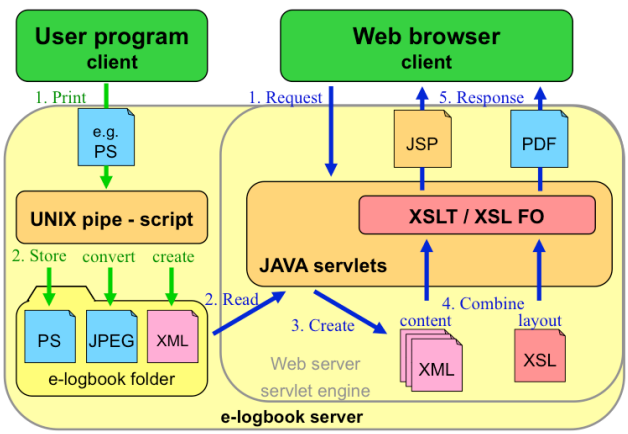

Figure 1: The basic e-logbook architecture is unchanged until today.

One major demand for such an electronic version of the machine logbook was the ease for entering data. The institute wide availability of common printer queues, led to the idea of using these for pushing graphical data to the e-logbook (see left part in Fig. 1).

We will not investigate the e-logbook architecture in this paper in more detail since this has already been discussed elsewhere (see e.g. [1]).

EXTENSIONS AND IMPROVEMENTS

These basic concepts haven't changed since the first days of the DESY e-logbook, but much has been done in this still very vital field.

The huge number of e-logbook users fostered the continuous development and extension of many components over the last years as shown in Fig. 2.

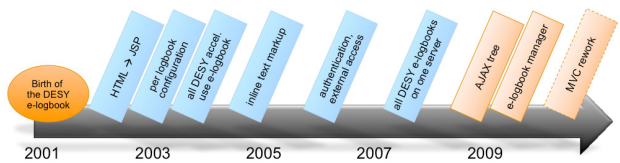

Figure 2: Extensions and changes done to the e-logbook since the first version.

The items from 2009 on will be discussed in this paper in more detail whereby others have already been presented in e.g. [2] and will therefore not be covered again.

AJAX Navigation Tree

Many users over an over experienced problems running the Java applet (Java code running on the client side) we used for navigation within the e-logbook tree structure. Because of this and the difficulties to synchronization data between the client side Java Applet and the server side content delivery, we decided to develop a new navigation tree based on AJAX (asynchronous JavaScript and XML) technology. To ensure browser independency of this client side code, we made use of the widely used "Prototype" (see [3]) AJAX framework.

Using this technique we could achieve:

- much better user experience (tree loads faster)
- triggering of dynamic reload for changes on the server side
- ensure synchronization of server content and navigation tree

A critical part in this change has been the shifting of the whole CPU load caused by the navigation tree running on all clients to the one server instance. Most probably due to the smart data transfer technique (see Fig. 3), used by the AJAX communication, we could not see any sign of

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performance degradation even after transforming all ~50 e-logbook hosted by our central server machine.

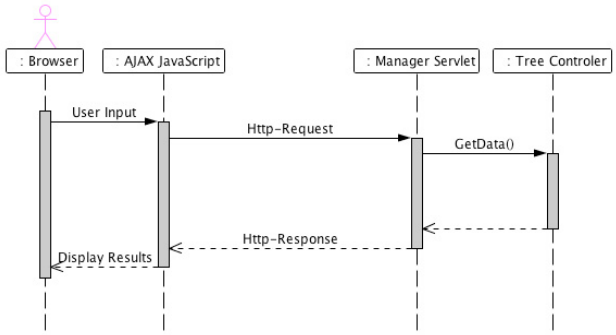

Figure 3: Data transfer between client and e-logbook manager.

E-logbook Manager

The management of the states and updates of the navigation tree but also of the periodic jobs scheduler, so far run by the UNIX clock daemon ("cron"), triggered the development of an administrator application, we called the *e-logbook manager* (see Fig. 4).

In this web application one can manage all functions needed to run the periodic jobs like the creation of new shifts, but also freely definable jobs for e.g. updating machine status values or other utility functionality.

The application further serves as front end to all e-logbook configuration parameters, like language settings, keyword lists, etc.

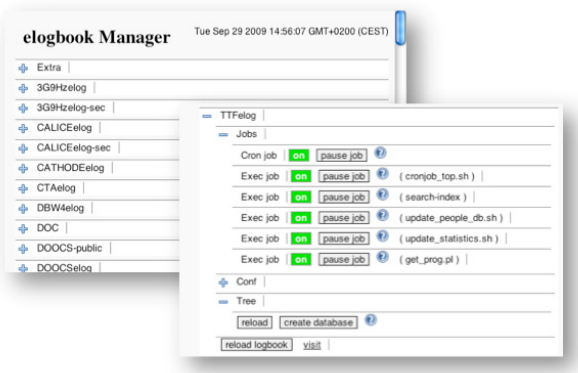

Figure 4: E-logbook administrator application showing the list of e-logbooks and an opened task view.

Working with the huge number of e-logbooks, our machine at DESY is hosting, the e-logbook manager has proven to be an essential tool for operating and maintaining the e-logbooks.

This step of wiping out all non web based parts ease the distribution of the e-logbook to other institutes a lot. After finishing the rework discussed in the next section, this manager will even be **the only** part needed to set up and run the e-logbook at all.

OUTLOOK

Model-View-Controller Rework

To further extend and advance the configuration possibilities for the individual e-logbook instances, but also as a logical continuation of the e-logbook manager development, we decided to rework a big portion of the internal e-logbook logic.

The main idea was to unify and simplify the entrance to the e-logbook by use of a front controller servlet. Using this approach one can identify the building blocks of the e-logbook with the widely know **Model View Controller** architecture as shown in Fig. 5.

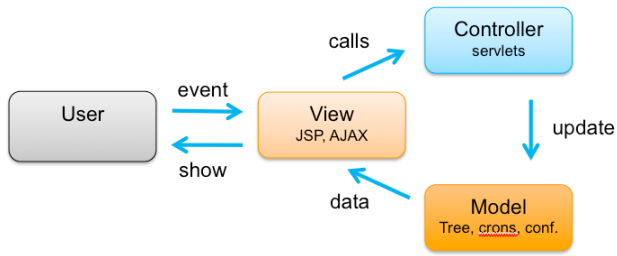

Figure 5: Identifying the e-logbook part with the Model-View-Controller architecture.

- **View**: Receives user input, displays data (JSP, AJAX)
- **Controller**: Controls access, updates model (servlets)
- **Model**: Represents appl. state, stores data (e-logbook manager)

This rework allows a clean integration of e.g. LDAP or IP based access control and authorization schemas, which are more and more requested already for the DESY internal e-logbooks. But also it will enable us to finally integrate all functions needed for set up and management of a complete e-logbook implementation into the e-logbook manager. Thus all one needs to set up a new e-logbook implementation will be to "deploy" the manager war file (web archive) to a servlet container and configure the e-logbook to its needs using the web interface.

FACTS AND THOUGHTS

The interest and therefore requests for copies of the DESY e-logbook is still not ending. Until today roughly 20 institutes got copies and many are using the DESY e-logbook now in standard operations (see Fig. 6).

Figure 6: DESY e-logbook usage around the world.

Many of the changes done in the near past targeted to ease the packaging and deployment to serve these requests for the e-logbook.

Even though the installation and configuration of the e-logbook has been developed towards the status of standard software, still many feature requests and/or special demands are needed to be served (the past showed that there is roughly 1 e-mail/day concerning support or feature requests!).

Further did the usage of the e-logbook at least at DESY extended beyond the classic logbook area e.g. as group book or even as help system (see Fig. 7).

Figure 7: Usage of the e-logbook as help system.

CONCLUSION

The nearly ten years of experience with the electronic logbook showed that it is an absolutely mandatory tool in every accelerator facility. One could even imagine seeing it as standard IT tool, together with the support and service.

Many parts of the e-logbook have shown to be quite optimal already since the beginning. But some of the concepts from the first hours are in need of rework, like e.g. the division between layout and data (XSLT – see [1]) which is hard to maintain.

Much has been done "under the hood" to get the amount of work, needed to serve the never ending requests for features and support, down. But still there is much room for improvements and extensions, so the story will go on.

REFERENCES

[1] R. Kammering et al., "An XML based web service for an electronic logbook", Proc. PCaPAC 2002; http://www.lnf.infn.it/conference/pcapac2002/TALK/WE-02/WE-02.pdf

[2] R. Kammering et al., "The Electronic Logbook @ the TTF VUV-FEL – Making the next step"; http://conference.kek.jp/pcapac2005/paper/TUB4.pdf

[3] Prototype JavaScript Framework; http://www.prototypejs.org/