

## j5 LOGBOOK – A COMMERCIAL E-LOGBOOK

D. Moore\*, St. James Software, Cape Town, South Africa  
 O. Goudard†, L. Hardy‡, ESRF, Grenoble, France

### Abstract

j5 Logbook is a commercial e-logbook from St. James Software. It is being used in Synchrotron and Linear Accelerator facilities to replace paper logbooks and other ad-hoc measures. It provides superior management of and access to the information collected, allowing for other roles to access the data - e.g. maintenance engineers for repair tasks and reliability improvement, managers for up-time statistics, work review and auditing reports, other operators for tasks or issues which persist for more than one shift. Its integration with common synchrotron Control Systems (Tango, EPICS) provide it with unique abilities to automatically gather important data. Its central server architecture and automated emailing facilities provide near instantaneous dispersion of data to interested parties.

### SIMILAR WORK

The most prevalent method for logging in control rooms remains the venerable physical logbook [4]. Some logbooks are mere notebooks. The better ones have a pre-printed structure, which help the operator know which data it is necessary to record when an event happens. The disadvantages of paper are well known, but the principal disadvantage must be the difficulty of searching through the history.

Microsoft Excel, or alternative spreadsheet software, is often used [4]. Like paper, it can be configured to provide helpful templates for the operators. It also provides automated calculation facilities which can help draw useful information from the data. Its principal problem is dispersion - it does not have the facilities to share a common spreadsheet, necessitating a machine devoted to the task, and it is difficult to implement the flow of data to the people who need it, e.g. engineers, so they are aware if there are reliability problems which need to be addressed.

A popular option is the Wiki [2]. This brings the advantages of templating and knowledge dispersion, as well as limited rights handling. Due to the lack of structure in wikis, a fundamental part of the philosophy behind them, search and filtering options leave a lot to be desired.

This is not the first electronic logbook. The TTF e-Logbook was written in 2001, and developed for years after that [6]. One of the facilities to use that product was ESRF (European Synchrotron Radiation Facility) in France [6], which then moved to a completely paperless control room using jLogbook 4 [3].

\* davidm@sjsoft.com

† goudard@esrf.fr

‡ hardy@esrf.fr

### j5 LOGBOOK

j5 Logbook is the successor to jLogbook 4. It runs as a Web Application from a central server. Client access is via web browser - standard installs of Firefox and Internet Explorer are supported. No other client-side installation is needed. On the server, j5 can integrate with most common databases in use (PostgreSQL, MySQL, SQL Server, Oracle), and can run on Windows or Linux. It either integrates with Apache or runs its own web server.

j5 Logbook emulates the look of paper logs to give a familiar look to operators. A user-friendly filtering interface is provided for searching through logs. User rights are specifiable to a fine-grained level. The rights affect all aspects of the user interface - which logs the user can view, which they can edit, which values they are allowed to edit and what they are allowed to change them to. Predefined filter buttons provide quick access to the most commonly needed filters. Multiple layered groups are supported, as well as LDAP (Lightweight Data Access Protocol) integration, allowing for effective management of large user bases.

Hierarchical combos provide ways to model the drilling down process to parts of the operation - e.g. Beam Transport A, Vacuum, Pressure. Selection such as this eliminates many causes of error, and allows the data to be easily searchable. Colour and style changes associated with the selection are managed to improve the visibility of important and critical logs.

Navigation is via a breadcrumbs-style interface, which makes navigating a complex hierarchy easy while not removing too much white space from the display. Users only see parts of the hierarchy they have permission to access. The navigation structure is completely customisable, although experience has taught that a simple setup combined with group-specific filters and rights remove most of the complexity from the hierarchy.

Logbooks can be added or edited with ease, in a simple wizard interface (see Fig. 1). The look of the logbooks can be customised to a large degree, using a mixture of Wiki-style areas and table layouts. The types of fields which can be added range from the simple (an integer value) to the complex (a widget which reads a set of values from Tango (Taco Next Generation Objects) or EPICS (Experimental Physics and Industrial Control System) and produces a graph when the log is created).

### AUTOMATED DATA COLLECTION

j5 Logbook provides connection possibilities to EPICS, Tango, OPC (OLE for Process Control, where OLE is Object Linking and Embedding) and PI (Performance Im-

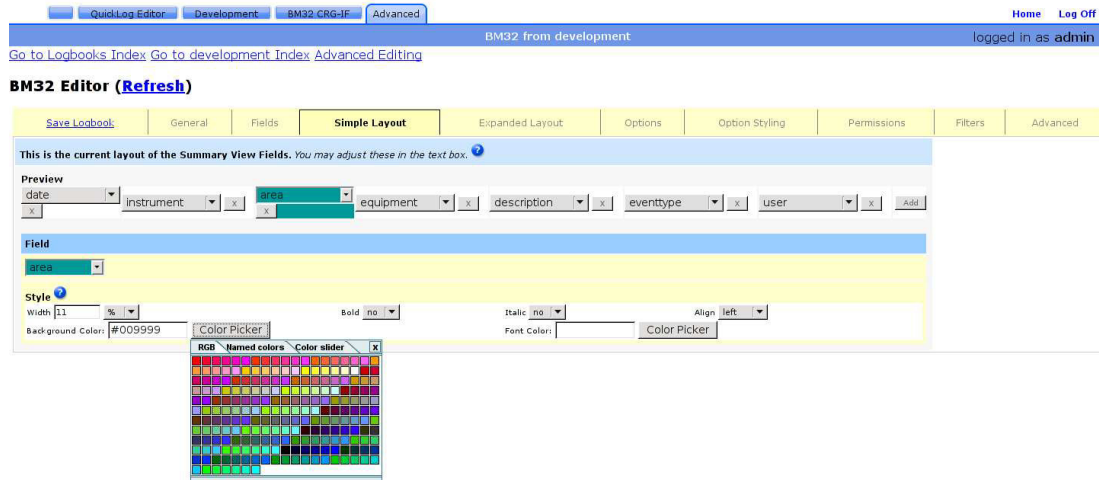


Figure 1: A screen from the QuickLogs creation wizard. On this screen, the layout of the contracted view of a log is being edited.

provements). Integration of any further data sources is simple by implementing a short interface in Python. There are inputs to handle integers, floats, strings and Tango graph events currently available (see Fig. 2). The inputs are extensible, and it is easy for a skilled programmer to add custom inputs.

Device values are includable in logbooks as automatically read values, requested values (read when a button is clicked) or in logs automatically generated in response to certain events.

An example of the latter would be a logbook configured to automatically generate logs on the receipt of Alarm events. In the event of an alarm, it is often not just one alarm which goes off - an alarm triggers, but the condition causes another alarm to trigger, which causes more alarms

to trigger. By the time an operator notices, there could be several alarms activated. It is difficult to see which alarm triggered the events. With automated generation of logs, logs would be generated in the order that the alarms happened, and it can clearly be seen what went wrong first.

## AUTOMATED REPORTS

Inefficiency abounds where the people who need to know when certain events happen never obtain the information. j5 Logbook directs the right information to the right people through its automated emailing and messaging systems. Emails can be sent on every log, or as a scheduled report. This can be configured so only logs which match certain criteria will be sent.



Figure 2: An open logbook. Automatically read values and two automatically generated graphs can be seen. The values were read from Tango.

There is also a system for automated message sending on a variety of other systems. Initially designed to write values back to OPC, it has also been used to send SMSes. A simple interface leaves open the possibility of integrating other systems which support writing back. As an example, this could be used to automatically adjust device settings through Tango.

## SHIFT REPORTS

An important aspect of any operation run by shifts of operators is the shift handover report. Teams of operators work in the control room in shifts. It is essential, when they leave, that the incoming shift knows what current issues require attention. If there is no formal handover, issues can easily get lost, leading to downtime which could have been easily prevented.

A basic shift report serves to collate all the notable events which happened in a shift, for use in performance review and reports, and to effectively hand over those issues which require more action. It can force the incoming operators to read over the open events as the first thing they do on their shift. It can help to pinpoint when problems occur, and whether they are related to a specific shift.

Figure 3: The shift configuration interface for the simplest shifts module.

Shift management can be easy or complex, depending on the way a facility operates. The simplest j5 Logbook Shift Management module requires very little information to start working (see Fig. 3), with a constant number of equal-length shifts per day and the same schedule every day. More complex modules can scale up to handle different shift schedules on different days of the week, scheduled shift changes, assigning users to shifts automatically based on their group membership and a rotating shift schedule.

## FUTURE WORK

St. James Software, which created j5 Logbook, has an Historian product as well. Work has started in integrating this with the Logbook in easy-to-use modules. The Historian is easily extensible for custom calculations. Calculations can also be chained together.

We have a few ideas of applications of the Historian in control room environment. A shift report module could be made to show a graph of ten-minutely averages of critical values over the course of a shift. An alarm could trigger the retrieval of maximum and minimum values of tags leading

PCaPAC Traditional Topics

up to the alarm, in addition to the values at the time of the alarm. Reports could allow zooming in on data on a shift - for instance, at a sudden increase of a value, the data events around the sudden increase could be requested in more detail.

## CONCLUSION

In any large-scale operation such as a Particle Accelerator, downtime, when nobody is making use of the Accelerator, is expensive. Products which help to minimise that downtime are a worthwhile investment, as the cost of the product can fairly quickly be offset by the savings in reliability.

By providing a reliable interface to capture the relevant data in a semi-automated way, j5 Logbook provides the best combination of operator knowledge and machine reliability. Once the data is captured, the searching and automatic reporting functionality ensures that those who can do the most to solve problems get the information they need as soon as possible.

Electronic logbooks are gaining in traction as the only adequate solution for the management of beam instrumentation devices [5] [7]. j5 Logbook is the most feature-rich, easy to use and effective electronic Logbook currently available.

## REFERENCES

- [1] j5 is a product of St. James Software, <http://www.sjsoft.com>.
- [2] AHATS Field Project Logbook, retrieved 14 October 2008, <http://wiki.ucar.edu/display/ahatslogbook>.
- [3] L. Hardy, J.-M. Chaize, O. Goudard, S. Cross, D. Fraser and N. Hurley, "Evolution and Status of the E-Logbooks At ESRF", EPAC'08, Genoa, June 2008, TUX03, <http://www.epac08.org>.
- [4] D. Glass, G. Guasco and N. Hurley, "Networked Electronic Logbooks", WAO'07, Trieste, September 2007, MOBMR04, <http://www.elettra.trieste.it>.
- [5] K. Wittenberg, "Proceedings of the 3rd CARE-HHH-ABI Workshop", CARE-Conf-05-044-HHH, Hirschberg, December 2005, p. 24, <http://www.desy.de>.
- [6] R. Kammering, O. Hensler, A. Petrosyan and K Rehlich, "The Electronic Logbook @ The TTF VUV-FEL Making The Next Step", PCAPAC2005, Hayama, March 2005, TUB4, <http://www.pcapac.org>.
- [7] H. Ehrlichmann, "The Users Perspective", PCAPAC2005, Hayama, March 2005, TUB1, <http://www.pcapac.org>.
- [8] R. Kammering, O. Hensler, A. Petrosyan and K Rehlich, "Review Of Two Years With An Electronic Logbook", ICALEPCS2003, Gyeongju, October 2003, pp. 303-305, <http://www.icalepcs.org>.