

# The PSI digital user office DUO: an administrative web interface using PHP

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## Abstract

Derived from the concept of Virtual User Office (VUO) at Elettra in Trieste, the PSI Digital User Office (DUO) is an application that covers all needs of proposal handling for SLS. Fully implemented in PHP, the system uses a unique template approach to access the data in the underlying Oracle database in a consistent way and to decouple the user interface from the code as well as the database layer. Beyond the proposal handling related features, one of DUOs strengths is its position as an integrating system: For instance it supports account management via an LDAP database or the ability to import information from the ISI publication database.

## 1 User facilities at PSI

The Paul Scherrer Institute operates four major user laboratories: a third generation X-ray synchrotron source (SLS), the only continuous spallation neutron source worldwide (SINQ), the world's most powerful continuous-beam  $\mu$ -SR facility ( $S\mu S$ ) and a meson factory for fundamental nuclear and elementary particle physics (LTP). A joint user office has been installed recently to serve users to all those four facilities and to enhance the use of synergy effects.

## 2 Functional Overview

At SLS, users can submit proposals for experiments the 'digital way': DUO handles the proposal workflow, from the point the users start to write the proposal up to the end of accepted experiments. For the user office DUO provides an efficient way to handle some hundred proposals per year. DUO's functionality can be divided roughly into the following parts:

- Handling of proposals ( submission, review process )
- Scheduling of experiments
- Badge and dosimeters requests

- Bookkeeping of users, experiments, addresses
- Statistical functions, reporting
- Contact to users per mailing lists

DUO is a web application written in PHP[1]. Figure 1 gives an impression of the look and feel of DUO. Since some of the functions the users requires from DUO can easily be broken down into sequences of small steps, the concept of 'wizard style' pages is used many fold.

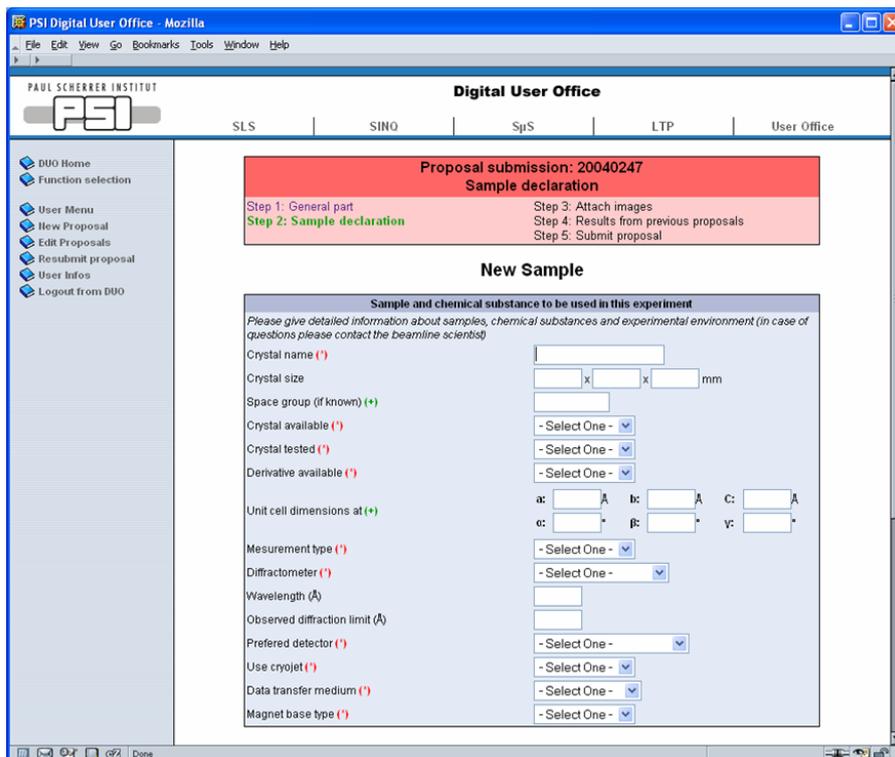


Figure 1: Proposal submission: A typical DUO page. The submission is divided into 5 Steps, on top of the page , a 'wizard-style' box displays them.

## 3 DUO insights

### 3.1 Architectural overview

Figure 2 shows the general architecture: DUO is based on the open source packages Linux, Apache and PHP. Oracle is used as database.

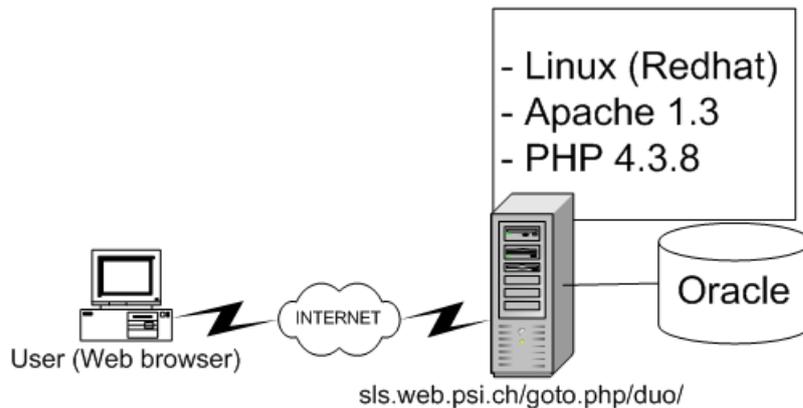


Figure 2: Basic architecture: Linux/Apache/PHP/Oracle

### 3.2 Code design

In order to keep the maintainability of the system as high as possible and to simplify the developing effort, each PHP page fulfills usually just one task. Code parts shared among pages are located in libraries. The library `util.php` ( includes template engine, pdf/excel export, db access ) and `sec.php` (security) are part of the DUO development. Fig. 3 reflects this structure. ADODB [2] is the database abstraction layer. The used PHP modules (`oci8`, `pdflib`, etc. ) are equivalent to common PHP setups.

### 3.3 Integrating system

Beside the users, DUO communicates with additional systems and uses a wide range of technologies for that purpose. Examples:

**Flat files** are used to exchange data about user visits with the PSI admittance control system.

**LDAP** is used to create experimental accounts for each accepted proposal. The account information is mailed to the users together with the invitation email and can be used to log into the user workstations at SLS. The LDAP database is used for authentication on linux and windows systems.

**Excel** files are created for various kinds of reports. The file format of Excel 2.1 has proven to be easy to write and can still be read by current versions of the program.

**http** is used to query information from other servers.

PHP as the programming language supported the usage of these interface technologies very well.

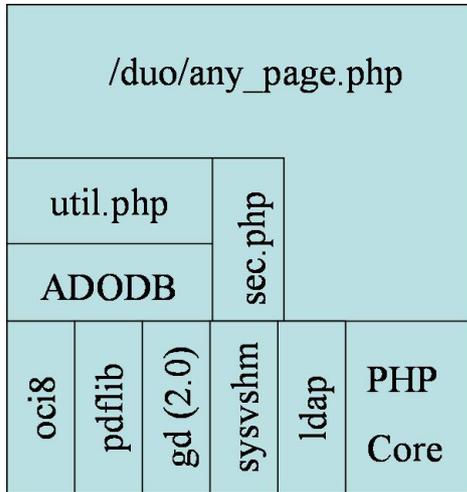


Figure 3: Code design of the PHP pages

### 3.4 DUO Templates

Beside the abstraction of code and page layout, the DUO template solution focuses a consistent view through the different possible views of the data ( add / edit / print ).

The template language provides various kinds of HTML input elements like simple text fields, drop down lists or read only fields. If the template is used in an add or edit view, the template engine will add JavaScript code to the page for validating the user input ( e.g. mandatory fields or numbers ).

The code below is part of the template file 'institutes.html', showing the description for the fields 'DEPARTMENT' ( the tag '@TEXT' will show this as a simple text field ) and 'INSTTYPE' ( the tag '@SELECT' will show this as a drop down list, filled with the result of the query 'select insttype,name from ..'):

```
...
<TR><TD>Departement</TD><TD>@TEXT@FIELD=DEPARTMENT,SIZE=40@</TD></TR>
<TR>
<TD>Inst. type </TD>
<TD>@SELECT
  @FIELD=INSTTYPE,NAME=''Institute type'',
  QUERY=''SELECT INSTTYPE,NAME FROM INSTYPES ORDER BY NAME'',
  DEFAULT=''U''@
</TD>
</TR>
```

A template can be used with various functions of the DUO library 'util.php'.

Display an HTML form that allows to *add a new* institute for example:

```
<?PHP show_add_page("institutes.html",db);
```

Display an HTML form for *editing* an existing row:

```
<?PHP
$q="SELECT * FROM INSTITUTES WHERE..."
show_edit_page("institutes.html",$q,$db);
```

Display a *read-only* view for the same DB record:

```
<?PHP show_view_page("institutes.html",$q,$db);
```

## **4 Future upgrades**

The integration of two further PSI user laboratories SINQ and S $\mu$ S will be the next major upgrade of DUO. For the funding of users through the access programs of the EU framework programs more functionality will be needed like tracking user visits and additional reports.

## **5 References**

[1] The PHP project site: <http://www.php.net>

[2] ADOdb: Database Abstraction Layer for PHP ( and Python): [adodb.sourceforge.net](http://adodb.sourceforge.net)