Concise paper

Using OpenOffice as a tool in teaching database administration

Albert van Aardt
Information Systems Programme
Northland Polytechnic
Whangarei, New Zealand
avanaardt@northland.ac.nz

ABSTRACT.

It is not widely known that the OpenOffice.org suite contains a very capable database front-end component that can be used to access a number of Database Management Systems (DBMS's). In this paper the use of OpenOffice Base (as it is called) to access various DBMS's is explained and its use as a teaching tool is explored.

Keywords

database administration, open source software

1. INTRODUCTION AND BACKGROUND

> *"Database Administration involves the overall design and management of the database. Administration tasks include archiving, consistency checks, developing/maintaining indexing and retrieval functionality, migration, monitoring, performance issues, replication issues, and database sizing/space management" (http://oracle.ittoolbox.com/nav/t.asp?t=381&p=381&h1=381)*

Students are confronted with various software tools, each with its own interface and idiosyncrasies. (See http://www.tdan.com/i005fe04.htm for a selection of tools). This situation has had the unfortunate side effect that students tend to get bogged down in the complexities of the particular DBMS and in the process struggle to understand the basic concepts of database design. In addition, students tend to become proficient in a particular commercial product, rather than to be able to extend their knowledge across products. "Without explicit instructions, students do not master the art of using available tools to solve problems; therefore, teachers need to question whether their teaching practices provide explicit instruction to develop students' problem solving skills" (Chen and Ray, 2004, p. 10).

In the past this situation was accepted as being "how it is" -- students simply had to learn these tools before they could do any work on a particular DBMS. Academic textbooks often cover only a particular software tool (Rob & Coronel, 2004, pp. 741 - 755). This paper will simply evaluate the usefulness (or not) of using the OpenOffice software as a simplified database teaching tool. Using software to illustrate the concepts of database management and design is not uncommon; see for example Douglas and Barker 2004.

Sun Microsystems donated the Staroffice 5.2 code base to the open source community in 2002 and a major rewrite of the whole suite followed. In 2003 Sun released Staroffice 7 and the OpenOffice.org community released OpenOffice 1.0. The next major release of OpenOffice is planned for June 2005, coinciding with the release of Staroffice 8. This office suite comprises of a word processor, a spreadsheet package, a presentation manager, a graphics editor, a scripting language and a database front-end.

During 2004 a number of large organisations have indicated that they will be using OpenOffice.org as a standard office suite; the latest (January 2005) being the French Police Department. Many observers are now considering OpenOffice.org as a viable suite for modern businesses. For example, the Australian PC

Authority magazine considers OpenOffice.org to be the "Editor's Choice" in the January 2004 issue, in preference to products such as Microsoft Office, Lotus Smartsuite, Corel Office and Ability Office. It is clear that OpenOffice.org is becoming a major player, and the fact that it is free is a big consideration

There are therefore two good reasons to use OpenOffice.org as a teaching tool: a simple and unified front-end to various DBMS's, and cost to students. For example: setting up OpenOffice.org and MySQL on any operating system has no financial costs, and students can build a fairly sophisticated database application on this platform.

2. METHODOLOGY

a. Review available literature on OOB. Use the Internet to find reference material / technical guides on the OOB facility to expand on available literature.

b. Install OOB on a number of platforms and link it to a number of Database Management Systems (DBMS)

c. Test the functionality of the software by creating a simple database. Generate SQL queries to test the database connection. Test the software in a LAN client / server environment.

d. If c) is successful, demonstrate to students that the same interface can be used across platforms and DBMS's to maintain the database in a client / server environment

e. Evaluate the software in terms of some basic DBA functions and draw a conclusion.

3. LITERATURE REVIEW

Documentation on the OpenOffice database front-end was (and still is) very limited and sparse. Koch et al (1999) covers StarOffice 5.1, which differs so drastically from Staroffice 7 that it simply isn't usable. The StarOffice 5.2 User's Guide (2000) devoted 20 pages out of 490 on this topic; Haugland and Jones (2001) uses 47 pages out of 1121, duplicating it in their 2002 book. In these books the emphasis is purely on using OOB to set up tables for simple office tasks, such as a mail merge, but the technical detail of connecting to a DBMS was skipped.

Not surprisingly there is more recent and usable information available on the Internet. (See "Additional Sources" below) The OpenOffice documentation website (http://documentation.openoffice.org) has some up-to-date material. The best technical source was found to be John McCreesh's document on the Unixodbc.org website, in which he describes the whole process of installing all the software and how to link OOB to a database.

4. SOME NOTES ON SOFTWARE INSTALLATION AND CONFIGURATION

OpenOffice is available from http://www.openoffice.org but is widely being distributed by many organisations. Almost all modern Linux distributions now include OpenOffice.org as part of the standard package, and it is installed by default. Even so, installation on Windows, Linux or Mac X is very simple and straightforward. OpenOffice.org provides clear instructions and a comprehensive installer.

The OOB has built-in access to ODBC, JDBC, MySQL and Adabas. In this paper the ODBC functionality will be explored, as all modern DBMS's have ODBC drivers. Once OpenOffice.org is installed, the user needs to set up the ODBC connections to the various DBMS's.

In MS Windows this is a simple matter:

1. Install the DBMS (e.g. MySQL MS SQL Server, Oracle, Caché, if not already installed)

2. Install the ODBC driver for the particular DBMS, e.g. MyODBC for MySQL

3. Create a database on the DBMS.

4. Use the ODBC Data Source Administrator in Administrative Tools from the Control Panel to create a new ODBC connection to the newly created database.

(This has been tested on Windows XP Professional connecting to MS SQL Server, MS Access, Oracle 9i, Caché 5 and MySQL 4.0)

In Linux it is slightly more complex, but still well within the capability of students. Steps 1, 2 and 3 are the same as above, then:

5. Install unixODBC (if not already installed)

6. Create a new ODBC connection to the new-

ly created database. This is done by ensuring the files odbc.ini and odbcinst.ini contains the correct parameters. (See McCreesh, 2002 for examples of MySQL parameters). A number of tools exist to set up the ODBC connections, but the easiest is still to simply edit these files with a text editor. Some Linux distributions contain ODBCConfig, which is functionally the same as the Windows ODBC Data Source Administrator and can be used to set up the ODBC connections.

7. OOB looks for a library libodbc.so. As root user, set up a symbolic link in a terminal window:

```
ln -s /usr/lib/libodbc.so.1 /usr/lib/
libodbc.so
```

(This has been tested on Suse 9.1, RedHat 9, Fedora Core 3 and Xandros 2.0 using MySQL)

5. USING OOB AS A DATABASE ADMINISTRATION TOOL.

1. Once a database has been created via the DBMS tools, students can use OOB to create tables inside this database. The table creation facility of OOB allows a user to allocate standard attributes to the fields, add and delete fields and allocate a key field. New fields can be added later, or fields can be deleted (if the DBMS allows this).

2. Data can be entered directly into the newly created table. Tables can be sorted on any field and "filters" can be applied, effectively creating a specific view of the table.

3. Data can be retrieved from a table directly into a spreadsheet, thus allowing various analysis techniques to be applied.

4. The OOB Report writing facility enables the user to set up an SQL query to extract the data and present it in a report format. This is very useful for a DBA to extract data (for example) when looking for corrupted data. The actual query is contained inside the report, which makes it easily transportable. For example, a report can be kept on the main database server and accessed from any client that has OpenOffice installed; effectively giving the DBA a set of "roving" queries that can be run from anywhere on the LAN. This is particularly useful where the DBA needs to do a quick query but is not on a workstation with the DBMS administration tools installed.

5. Complex queries can be set up using the simple Query Designer. However, the "New Query (SQL view)" tool enables the student to set up an SQL query in the SQL format of the particular DBMS. In other words, if a DBMS has a particular SQL syntax, the student can bypass the standard SQL92 statements generated by OOB and execute the specific SQL query directly on the DBMS. This is particularly useful for students getting to grips with the details of a particular flavor of SQL.

(Detailed information can be found at: http://documentation.openoffice.org/HOW_TO/data_source/link_tablehtml/link.html)

6. EVALUATION

Rob and Coronel (2004, pp 712 - 757) give a comprehensive view of the tasks of the DBA. They cover topics such as database creation, configuration, security, storage and capacity management, backup and restore; all of which are handled by the DBA tools of the particular DBMS. Clearly the DBMS specific tools provide the "heavy duty" functionality needed by the DBA. Rob and Coronel go on and explain the various DBA functions by using the Oracle Enterprise Manager tools. This of course means that the DBA needs to have these tools installed on a workstation, which in turn has certain licensing implications.

OOB cannot be used to create a new database, do the physical space management, fine-tuning, security monitoring etc., but it can be used for some basic tasks as discussed above. Students found using OOB very easy to learn and were surprised by the capabilities of OOB. Doing simple tasks were found to be much quicker in OOB than in the particular DBMS tools. Using an OOB report to extract data and use that as a form of backup was one technique discussed.

However, clearly OOB cannot be used as a comprehensive DBA tool, replacing the particular DBMS tools. OOB is useful for the "quick-and-dirty" type of activities is easy and straightforward, but for detailed and "heavy duty" work the DBMS tools are obviously superior. The big advantage of OOB is that it can be installed on any client anywhere on a LAN and used for these

simple tasks.

Of course, one could achieve a similar effect by using Microsoft Access as a front-end to SQL Server, but the cost to do this makes it impractical for students. For students, using OOB at home with (say) MySQL has the added benefit that they can practice their skills without incurring any costs. (Note: OOB contains its own programming language, called OO Basic. It is quite feasible to build a database application system using OO Basic + OOB + MySQL, but that activity falls outside the scope of this paper. See: http://www.ooomacros.org/).

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