OPEN-SOURCE TOOLS FOR DEVELOPMENT OF INTERNET-BASED DATABASE APPLICATIONS

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Abstract:
Open source options for software development offer ways to get software projects done during the current brutal economic climate by providing community-based resources and saving users from paying licensing fees. Open-source applications are gaining more approval in enterprises, particularly in the areas of operating systems, infrastructure applications and development tools.
In this paper, I demonstrate how it can developed a web database application with the triad of PHP, MySQL, the Apache web server and ScriptCase, a complete PHP code generator. This software project is proposed for Ministry of Agriculture, Forests and Rural Development (Romania) and it manages the informations of ecological products.

Key words: web architecture, internet based databases, open source software, development tools

JEL classification: C88, M15, Q13, Q57

1. Introduction

The Web brings everything closer together. It collapses distance and automates interaction, giving us on-demand access to information, people, and suppliers wherever they are. This ready availability is changing the way we work and do business. We expect real-time information, we engage in instant conversations, we form teams that straddle international borders and time zones, and we source goods and services from wherever we can discover the best timeliness and value.

2. The Web- enabled workplace. Web architecture.

The business workspace is going on demand. A new, connected way of working is breaking down the old, functional silos of activity that kept workers isolated in their desktop cubicles. Rippling across the modern, Web-enabled workplace, it links people wherever they work and collaborate – in workplaces, virtual spaces, meeting rooms, and mobile devices. This tide of change, driven by mobile and Web connectivity, is gathering strength from the rise of Internet-based business automation. The workplace is becoming virtual.

For every application the architecture is very important. It describes how the different components of a complex application relate to one another. Architecture is the starting point for the design of any application. It helps identify at a high level all of the relevant technologies and the standards those technologies will use to integrate. In the web architecture, the web browser talks to the server using HTTP.

There are numerous architectures used in database applications. I presented next the client-server web architecture.

The client-server web architecture [1] is a little more complex; the structure and information exchange flow is presented in figure 1. In this process are involved four entities: a web browser (Internet Explorer, Netscape, Mozzila), a web server (http server), a script engine (PHP, ASP, Pearl) and a database server (MySql, Oracle, Ms SQL). The script engine offer a double interface between web server and database

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server, and permit the communication between software components by exchanging data independently to the internal language.
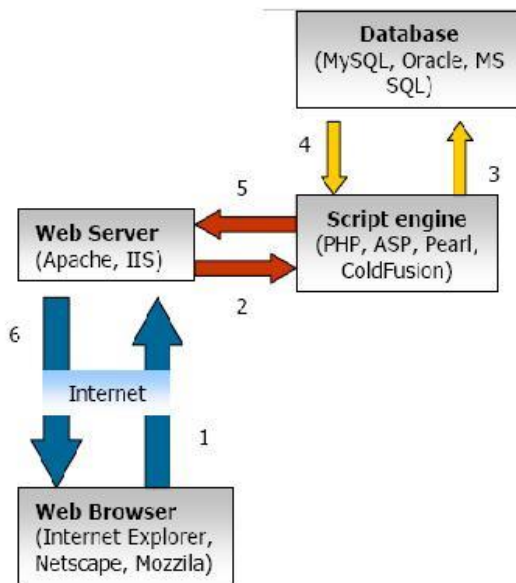

Figure 1. Client-server Web architecture.

The typical transaction with a relational database access consist in six steps [3]:

1. A web browser launch a http request to upload a web page to the http server.

2. The web server get and transmit the client request to the script engine for processing.

3. Script engine begin the script analysis. Inner the script there is a command to connect with the database to process the request. The script engine open an connection to the database server and send the adequate query to extract requested date from the database.

4. The database server receive the database query, process it and send the result back to the script engine.

5. The script engine finished the script running, formatted the query results into an html document. This resulting document is send to the web server.

6. The web server transmits the html document back to the client browser for viewing.

There are many servers working on the web but two dominate the market: Apache server and Microsoft IIS (Internet information Server). Apache is the most popular web server. In line with Linux, PHP and MySQL, Apache server is an open-source project that run excellent under Unix platform and Windows, it is very rapid and stable system. Apache use third-party modules that are integrated into the application, for instance, PHP run as an Apache extension.

There are some fluctuation depending on the market competition, but Apache is the most dominant server on information market.

According the latest statistics made by Netcraft in September 2009 (the table below), the main developers are grouping to active sites, [4]

Developer	August 2009	Percent	September 2009	Percent	Change
Apache	104,611,555	46.30%	105,416,925	46.62%	0.33
Microsoft	49,579,507	21.94%	49,615,010	21.94%	0.00
qq.com	30,278,988	13.40%	30,069,048	13.30%	-0.10
Google	14,213,976	6.29%	13,767,338	6.09%	-0.20
nginx	11,502,109	5.09%	12,676,238	5.61%	0.52

3. The new economic imperative for developing open source Internet-based database applications.

Databases exist so that people can interact with them. In the case of electronic databases, the interaction occurs not directly with the database, but indirectly through software applications. Before the emergence of the World Wide Web, databases typically were used by large corporations to support various business functions: accounting and finance, shipping and inventory control, manufacturing planning, human resources, and so on. The Web and more complex home computing tasks have helped move the need for database applications outside the realm of the large corporation.

Therefore, it is not surprising that the area in which databases have experienced the most explosive growth, in area where MySQL excels, is web application development. As the demand for more complex and robust web applications grows, so does the need for databases. A database backend can support many critical functions on the Web. Virtually any web content can be driven by a database.

Once it have installed the DBMS software on computer, it can be very tempting to just jump right into creating a database without much thought or planning. As with any software development, this kind of ad hoc approach works only with the simplest of problems. If you expect your database to support any kind of complexity, some planning and design will definitely save you time in the long run. So, first it must be the design (with all steps, inclusive normalization) and then its deployment.

In present, open source options for software development [2] offer ways to get software projects done during the current brutal economic climate by providing community-based resources and saving users from paying licensing fees. Open-source applications are gaining more approval in enterprises, particularly in the areas of operating systems, infrastructure applications and development tools.

This hasn't happened overnight, but by the late 1990s, many corporations began switching to open-source software for their Internet needs. It's scalability, both on the technical and business—no need to continuously buy new licenses—made it ideal for the Internet. Now, open-source software stacks have been moving from edge servers on the Internet and department servers for branch offices to core business applications.

In this moment, the triad of PHP, MySQL, and the Apache web server is one of the most popular web development platforms. There are several good reasons for PHP's popularity as a web scripting language: it is easy to include PHP scripts in HTML documents, PHP is free in a monetary and open source sense, it has over a hundred function libraries, and it shares syntax with C or Perl-like languages.

The focus of this paper is the web architecture since it is the most common architecture in which MySQL (DBMS software) is used.

With my study, I demonstrate how it can developed a web application without write any code lines.

The easiest approach to getting started in a Microsoft Windows environment is to use an installation package that includes Apache, PHP, and MySQL and I used the **PHP Triad** for Windows, available from http://sourceforge.net/projects/phptriad/.

After that, it must installed the **ScriptCase,** a complete PHP code generator. Through a friendly interface, the ScriptCase creates web applications extremely fast with quality and team integration, saving time, lowering costs and increasing productivity. Scriptcase supports most used databases, like Oracle, DB2, MS SQLServer, MySQL, PostgreSQL, Sybase, MS Access and more.

The application´s source code is PHP and JavaScript and uses AJAX technology. The applications run completly independent from the tool and are compatible with Windows, Unix, AS/400 and others systems. The development is made directly through the browser, allowing team integration and distributed development.

Benefits:

- Saving Time and reducing costs.

- Portability and Distributed Development. ScriptCase is a web application that allows portability and integration for the development team. Using server side platform, ScriptCase allows the team to develop only using the browser (IE, Firefox). It reduces development cost.

- Development Focused on priority.

- Fast Learning using the Knowledge Base, On-line Support, Forum, Samples Video and Systems you will learn ScriptCase quickly. Building WEB applications will not be an arduous work anymore.

The first step is the development of database. I created it with phpmyadmin, also included in PHPTriad and accesed throught URL – http://localhost/phpmadmin. The following figure illustrate the database.

Figure 2. The database Ecological Products.

Whatever architecture is used, the most important is at the point where your application talks to the database. As a database programmer, you need to worry about how to get data from and send it to your database. The tool to do that is generally some sort of database API. Any API, however, requires a basic understanding of managing a connection, the transactions under that connection, and the processing of the data associated with those transactions.

The starting point of your database interaction is in making a connection. The details behind what exactly constitutes a connection vary from API to API. Nevertheless, making a connection is basically establishing some sort of link between your code and the database. The variation comes in the form of logical and physical connections.

The important thing is that once a connection is established, you can use that connection to interact with the database. You talk to the database in the form of transactions. A database transaction is one or more database statements that must be executed together, or not at all.

With ScripCase all these become very simple.

The following figures illustrated same important forms of this web application.
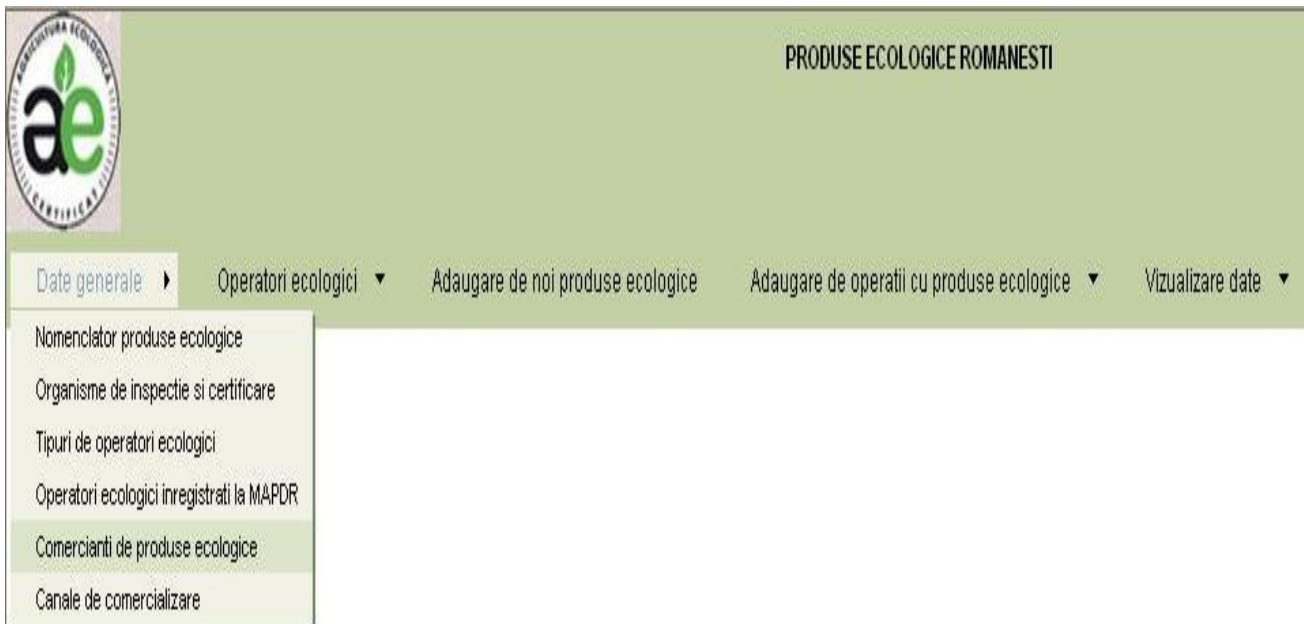
Figure 3. Home page of web application.

Figure 4.

Figure 5. Form of products adding.

Figure 6.

Conclusions

Technology still drives the new economy, the e-economy. The Internet - with the software and communications technologies that drive it - is changing everything. It has made so many surveys in this direction and the conclusions are:

- Software will continue to become increasingly complex.
- The new economy requires software that can be continuously updated.
- There are unlimited possibilities for software's growth.

Evolving business needs and technology innovations are driving continued changes in every aspect of the software delivery industry as a whole.

Methodologies are becoming more iterative, software architectures are becoming more modular, software interfaces are becoming richer and more flexible, and software implementation is becoming more adaptive and productive.

In these trends, open-source software fits very well with its advantages and disadvantages. Developing of a Web database application based on the open source software is a costless recommended solution in the actual context of the global financial crises.

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