

Web Database

Importance of 'Database on the Web'

- Databases are established technology for managing large amounts of data
- Separate Web is a good way to present information
- Updating data management from presentation improves efficiency
- updating
- finding information
- An online database is a database accessible from a network, including from the Internet.
- It differs from a local database, held in an individual computer or its attached storage, such as a CD.

A web database is a database that can be queried and/or updated through the World Wide Web (WWW). As web technologies are evolving, the WWW turned out to be the preferred medium for many applications, e.g., e-commerce and digital libraries. These applications use information that is stored in huge databases and can only be retrieved by issuing direct queries to the back-end databases. Database-driven web sites have their own interfaces and access forms that create HTML pages on-the-fly. Web database technologies define the way that these forms can connect to and retrieve data from database servers.

The number of database-driven web sites is growing exponentially. The dynamically created web pages by these sites are hard to be reached by traditional search engines. Traditional search engines are used to crawl and index static HTML pages. However, traditional search engines cannot send queries to web databases. The hidden information inside the web database sources is called the "deep web" in contrast to the "surface web" that is easily accessed by traditional search engines

Benefits of a 'Web Database'

Following are the benefits of using a Web Database:-

➤ Easy to Organize

The well-designed database allows for web designers to create pages that arrange the information in countless ways. In a catalog, for example, the product image may go in one section of the layout, the name of the product in another, and additional information below that. In addition, search results are much easier to sort. Tables are used to sort the data, with headers such as "Product," "Price," and so forth. The web visitor can be given the ability to choose by which category to sort simply by clicking on their preference.

➤ Future Redesigns are Easier

Keeping records in a database means that much of the content is kept separate from the "front end" visual design of the site. Website makeovers are common, happening every few years or less, which makes the separation of content and design extremely important. In a static

website with no database, a redesign would mean many hours spent transferring content to the new site. This equals greater cost. With the separated content of a database-drive site, the content can stay where it is. The redesign can be completed while the data remains intact. This equals huge savings, making the database an invaluable tool to the online business.

➤ **Dynamic Websites**

A well-designed database makes a website more effective. Products or information can be automatically generated to display on any given page. This is best demonstrated by online catalogs. Imagine creating every page by hand and then having to change every page by hand. A database allows the user to go in and change the necessary information in the item's record. Every mention of the item will be automatically updated. Without a database, the process would be tedious and potentially incomplete. With a database, the user can be assured the information about the product will be correct on every page in which it appears.

➤ **Ease of Access**

An online database allows the user(s) to log in from any computer connected to the Internet. Access is password protected and encrypted, making it a secure choice. The advantages of this are tremendous, allowing the company to make changes on the fly or at home after hours. No special software is needed, as the user logs in using a browser. All of the software is on the server, which is the system which hosts all of the website's files.

Commonly used Web Databases are:-

➤ **MySQL Community Server**

This DBMS gets the number one nod mainly because the community version is free and is a great platform to begin learning on. There are, of course, commercial versions of MySQL for sale once you get to the point where you are developing large scale commercial applications, but getting started will cost you a big fat nothing.

Initially MySQL was available on a small set of platforms, Linux for the most part. However, now you can put MySQL on pretty much anything that you can imagine including Linux, Mac and Windows.

There is also a community version of their MySQL Workbench tool which gives the beginner a nice GUI (graphical user interface) to visually design and work with database tables. MySQL Workbench is reasonably intuitive, helps the beginner learn syntax by allowing the user to see syntax created by the tool when a task is designed, and has decent help documentation. Better than the actual help documentation you can find a ton of online tutorials, blogs, articles, etc. on developing in MySQL.

➤ **Microsoft Access**

Unlike MySQL, Microsoft's Access is not free. However, as it is part of Microsoft Office, many developers already have it. Even if you don't use Microsoft Office you can still download a trial version of Access which will get you 60 days to play around with it and see if it is for you.

Access does have some key similarities to MySQL. It lets you design a table or task visually and then see the syntax that gets created. There are also some good and not so good differences. On the good side Access doesn't have two separate installations (one for the DBMS and one for the design tool) but rather all comes as a single application. On the down side, Access has some significant limitations. It's not nearly as flexible on which operating systems it can be installed on. More significantly, it has a serious limitation in how many concurrent connections it can handle before performance degrades. What that means is that Access is ideal for learning and for low traffic hobbyist websites but becomes sluggish and unsuitable for websites that have moderate or heavier traffic.

➤ **Microsoft SQL Server Express**

With this DBMS and the next two, we step up to the big boys. Microsoft SQL Server, Oracle and DB2 are the most popular of the major DBMS's. They each have separate design tools and server applications that must be installed.

In truth, Microsoft SQL Server, Oracle Express and DB2 Express are all very similar in tools and functionality. Their biggest differences lie in the syntax of their SQL, therefore, they are not really listed in any particular order. The Microsoft SQL Server option does have one drawback in that the operating systems it will run on are limited.

➤ **Oracle Express Edition**

Oracle Express also has tools and a separate server application. It also has more operating system options than Microsoft SQL Server Express. The download options are also much more abundant than the others in this list. But all the download info you really need to get started can be found

➤ **DB2 Express-C**

The install options and supported Oses of DB2 Express-C are very similar to those of Oracle Express. Online tutorials, articles and examples, however, are not as abundant as the other options in this list but are still more than adequate.

Features of MySQL

The following list shows the most important properties of MySQL.

- **Relational Database System:** Like almost all other database systems on the market, MySQL is a relational database system.
- **Client/Server Architecture:** MySQL is a client/server system. There is a database server (MySQL) and arbitrarily many clients (application programs), which communicate with the server; that is, they query data, save changes, etc. The clients can run on the same computer as the server or on another computer (communication via a local network or the Internet).
- **SQL compatibility:** MySQL supports as its database language -- as its name suggests -- SQL (Structured Query Language). SQL is a standardized language for querying and updating data and for the administration of a database. There are several SQL dialects (about as many as there are database systems). MySQL adheres to the current

SQL standard (at the moment SQL: 2003), although with significant restrictions and a large number of extensions.

- **Views:** Put simply, views relate to an SQL query that is viewed as a distinct database object and makes possible a particular view of the database. MySQL has supported views since version 5.0.
- **Stored procedures:** Here we are dealing with SQL code that is stored in the database system. Stored procedures (SPs for short) are generally used to simplify certain steps, such as inserting or deleting a data record. For client programmers this has the advantage that they do not have to process the tables directly, but can rely on SPs. Like views, SPs help in the administration of large database projects. SPs can also increase efficiency. MySQL has supported SPs since version 5.0.
- **Triggers:** Triggers are SQL commands that are automatically executed by the server in certain database operations (INSERT, UPDATE, and DELETE). MySQL has supported triggers in a limited form from version 5.0, and additional functionality is promised for version 5.1.
- **Unicode:** MySQL has supported all conceivable character sets since version 4.1, including Latin-1, Latin-2, and Unicode (either in the variant UTF8 or UCS2).
- **User interface:** There are a number of convenient user interfaces for administering a MySQL server.
- **Full-text search:** Full-text search simplifies and accelerates the search for words that are located within a text field. If you employ MySQL for storing text (such as in an Internet discussion group), you can use full-text search to implement simply an efficient search function.
- **Replication:** Replication allows the contents of a database to be copied (replicated) onto a number of computers. In practice, this is done for two reasons: to increase protection against system failure (so that if one computer goes down, another can be put into service) and to improve the speed of database queries.
- **Transactions:** In the context of a database system, a transaction means the execution of several database operations as a block. The database system ensures that either all of the operations are correctly executed or none of them. This holds even if in the middle of a transaction there is a power failure, the computer crashes, or some other disaster occurs. Thus, for example, it cannot occur that a sum of money is withdrawn from account A but fails to be deposited in account B due to some type of system error.
- **Foreign key constraints:** These are rules that ensure that there are no cross references in linked tables that lead to nowhere. MySQL supports foreign key constraints for InnoDB tables.

- **GIS functions:** Since version 4.1, MySQL has supported the storing and processing of two-dimensional geographical data. Thus MySQL is well suited for GIS (geographic information systems) applications.
- **Programming languages:** There are quite a number of APIs (application programming interfaces) and libraries for the development of MySQL applications. For client programming you can use, among others, the languages C, C++, Java, Perl, PHP, Python, and Tcl.
- **ODBC:** MySQL supports the ODBC interface Connector/ODBC. This allows MySQL to be addressed by all the usual programming languages that run under Microsoft Windows (Delphi, Visual Basic, etc.). The ODBC interface can also be implemented under Unix, though that is seldom necessary.
- **Platform independence:** It is not only client applications that run under a variety of operating systems; MySQL itself (that is, the server) can be executed under a number of operating systems. The most important are Apple Macintosh OS X, Linux, Microsoft Windows, and the countless Unix variants, such as AIX, BSDI, FreeBSD, HP-UX, Open BSD, Net BSD, SGI Iris, and Sun Solaris.

Speed: MySQL is considered a very fast database program. This speed has been backed up by a large number of benchmark tests (though such tests -- regardless of the source -- should be considered with a good dose of skepticism)