Chapter 1: INTRODUCTION

1.1 Introduction to Web Database Architecture:

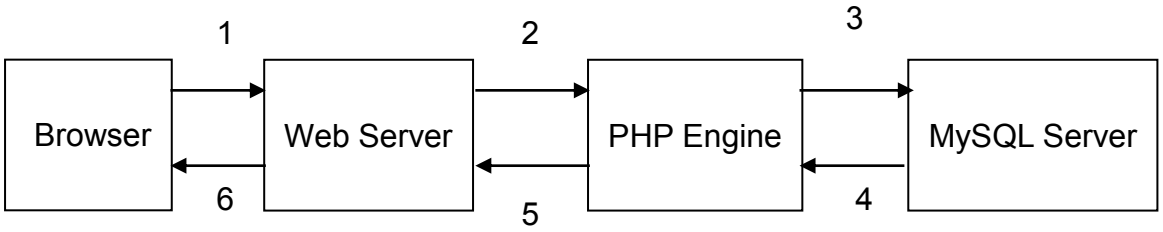

Fig1.1 Web Database Architecture

1. Browser issues an HTTP request for a particular web page
2. Web server receives the request, retrieves the file and passes it to the PHP engine for processing
3. PHP engine connects to the MySQL server and sends the query
4. MySQL server receives the query, processes it, and sends the results back to the PHP engine
5. PHP engine receives the results, prepares the HTML page and sends it to the web server
6. Web server sends the HTML page to the browser and browser displays the page to the user

MySQL + PHP Programming Model:

- Web site made from ".php" files on web server
- ".php" files contain HTML with embedded PHP code
- PHP code is enclosed in <?php ... ?>
- Basic steps followed in any PHP script used to access a database:
  - Check and filter data coming from the user
  - Set up a connection to MySQL server
  - Selecting the appropriate database
  - Query the database
  - Retrieve the results
  - Present the results back to the user
  - Close the database connection

1.2 Introduction to XAMPP:

XAMPP is a solution stack of free, open source software. The acronym *XAMPP* refers to the collective package of Apache HTTP Server, MySQL (database software) and originally PHP (but now sometimes Perl or Python) for Windows(operating system) to build a viable general purpose web server.

Though the original authors of these programs did not design them all to work specifically with each other, the development philosophy and tool sets are shared and were developed in close conjunction. The software combination has become popular because it is free of cost, open-source, and therefore easily adaptable, and because of the ubiquity of its components which are bundled with most current Linux distributions.

➢ Software Components:

Apache:

Apache is an open source web server, the most popular in use.

MySQL:

MySQL is a multithreaded, multi-user, SQL database management system (DBMS) now owned by Oracle Corporation. Alternatives at this level of the stack do also exist, for example by using PostgreSQL (LAPP). MySQL has been owned by Oracle Corporation since January 27, 2010 through the purchase of Sun Microsystems.Sun had acquired MySQL originally on February 26, 2008.

PHP:

PHP is a reflective programming language originally designed for producing dynamic web pages. PHP is used mainly in server-side application software.

1.3 Overview of the Components:

➢ HyperText Markup Language (HTML) :

HyperText Markup Language (HTML) is the main markup language for displaying web pages and other information that can be displayed in a web browser.

HTML is written in the form of HTML elements consisting of *tags* enclosed in angle brackets (like `<html>`), within the web page content. HTML tags most commonly come in pairs like `<h1>` and `</h1>`, although some tags, known as *empty elements*, are unpaired, for example `<img>`. The first tag in a pair is the *start tag*, the second tag is the *end tag* (they are also called *opening tags* and *closing tags*). In between these tags web designers can add text, tags, comments and other types of text-based content.

The purpose of a web browser is to read HTML documents and compose them into visible or audible web pages. The browser does not display the HTML tags, but uses the tags to interpret the content of the page.

HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. It can embed scripts in languages such as JavaScript which affect the behavior of HTML webpages.

➢ Cascading Style Sheets (CSS) :

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation semantics (the look and formatting) of a document written in a markup language. Its most common application is to style web pages written in HTML and XHTML.

CSS is designed primarily to enable the separation of document content (written in HTML or a similar markup language) from document presentation, including elements such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple pages to share formatting, and reduce complexity and repetition in the structural content (such as by allowing for tableless web design). CSS can also allow the same markup page to be presented in different styles for different rendering methods, such as on-screen, in print, by voice (when read out by a speech-based browser or screen reader) and on Braille-based, tactile devices. It can also be used to allow the web page to display differently depending on the screen size or device on which it is being viewed.

CSS specifies a priority scheme to determine which style rules apply if more than one rule matches against a particular element. In this so-called *cascade*, priorities or *weights* are calculated and assigned to rules, so that the results are predictable.

1.4 A Glance at the Apache Web Server:

The **Apache HTTP Server**, commonly referred to as **Apache**, is a web server software notable for playing a key role in the initial growth of the World Wide Web.In 2009 it became the first web server software to surpass the 100 million website milestone.Apache was the first viable alternative to the Netscape Communications Corporation web server (currently named Oracle iPlanet Web Server), and since has evolved to dominate other web servers in terms of functionality and performance. Typically Apache is run on a Unix-like operating system, and was developed for use on Linux. Apache is an open-source software.

1.5 Overview of the Components:

➢ MySql :

MySQL (Pronounced as "My Sequel") is the world's most used open source relational database management system (RDBMS) as of 2008 that runs as a server providing multi-user access to a number of databases.

It is named after co-founder Michael Widenius' daughter, My. The SQL phrase stands for Structured Query Language.

The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation.

MySQL is a popular choice of database for use in web applications, and is a central component of the widely used XAMP open source web application software stack (and other 'AMP' stacks). MySQL,Perl/PHP/Python." Free-software-open source projects that require a full-featured database management system often use MySQL.

➢ Hypertext PreProcessor:

PHP is an open source general-purpose server-side scripting language originally designed for Web development to produce dynamic Web pages. It is one of the first developed server-side scripting languages to be embedded into an HTML source document rather than calling an external file to process data. The code is interpreted by a Web server with a PHP processor module which generates the resulting Web page. It also has evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP can be deployed on most Web servers and also as a standalone shell on almost every operating system and platform free of charge.

While PHP originally stood for **P**ersonal **H**ome **P**age, it is now said to stand for **P**HP: **H**ypertext **P**re-processor, a recursive acronym.

Syntax for PHP

The PHP interpreter only executes PHP code within its delimiters. Anything outside its delimiters is not processed by PHP (although non-PHP text is still subject to control structures described in PHP code). The most common delimiters are `<?php` to open and `?>` to close PHP sections. `<script language="php">` and `</script>` delimiters are also available, as are the shortened forms `<?` or`<?=` (which is used to echo back a string or variable) and `?>` as well as ASP-style short forms `<%` or `<%=` and `%>`. While short delimiters are used, they make script files less portable as support for them can be disabled in the PHP configuration, and so they are discouraged. The purpose of all these delimiters is to separate PHP code from non-PHP code, including HTML.

Variables are prefixed with a dollar symbol, and a type does not need to be specified in advance. Unlike function and class names, variable names are case sensitive. PHP treats newlines as whitespace in the manner of a free-form language (except when inside string quotes), and statements are terminated by a semicolon. PHP has three types of comment syntax: `/* */` marks block and inline comments; `//` as well as `#` are used for one-line comments. The `echo` statement is one of several facilities PHP provides to output text.

Data type

PHP stores whole numbers in a platform-dependent range, either a 64-bit or 32-bit signed integer equivalent to the C-language long type. Unsigned integers are converted to

signed values in certain situations; this behaviour is different from other programming languages. Integer variables can be assigned using decimal (positive and negative), octal, and hexadecimal notations. Floating point numbers are also stored in a platform-specific range. PHP has a native Boolean type. The null data type represents a variable that has no value. The only value in the null data type is *NULL*. Arrays can contain elements of any type that PHP can handle, including resources, objects, and even other arrays. Order is preserved in lists of values and in hashes with both keys and values, and the two can be intermingled. PHP also supports strings, which can be used with single quotes, double quotes.

Function

PHP has hundreds of base functions and thousands more via extensions. These functions are well documented on the PHP site; however, the built-in library has a wide variety of naming conventions and inconsistencies. PHP currently has no functions for thread programming, although it does support multiprocessing programming on POSIX systems.

Advantages

- Simple and very easy to learn.
- Open source.
- PHP can be used on all major OS.
- It can plug-in with most of the databases.
- Powerful built in functions.
- Extremely useful for text processing features.

Disadvantages

- Security flaws due to unknown vulnerabilities.
- Not good to create desktop applications.

1.6 Introduction to Library Management System

Purpose:

Library Management System is a DBMS/web application which will provide an interface to each and every librarian who wishes to maintain records of books. After the details of the student have been registered by librarian, librarian can maintain the books he/she has borrowed.

The main objective of the Library Management System is to keep track of the books taken by the students at any time. And provide a complete and accurate picture of books present in the library.

The various users of the system are:

- **Librarian**: The librarian keeps track of all the students present under his/her branch. He/she can update new students joined to the college and can view all the existing students. They can check available books and add new books to the list.

Scope and Perspective:

- The Library Management System has one user that is librarian.
- The Librarian is responsible for the management of students and books.
- Students who are interested in borrowing books should have the library card number and then select their preferable book to borrow.
- The details of every student, staff and books borrowed can be maintained easily.