
# USING PHP, MYSQL DATABASE IN ECONOMIC PROBLEM

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https://doi.org/10.5281/zenodo.7985224

## INTRODUCTION

In the modern world, when solving issues of economics and management, much less time will be spent on entering the required information once. Any information, for example, about employees, can be formulated once and be available to all information subsystems (personnel accounting, planning, financial management, and many others).

Along with the reduction in labor intensity, another advantage of using databases arises - the possibility of independent collection and updating of data. Data actualization - updating the collected data on a specific date. This advantage is justified by three approaches. Firstly, it becomes possible to update at different times without fear of global errors. Secondly, it becomes possible to upgrade the application software packages that work with the database without disrupting the functioning of the software database of other departments. Thirdly, the possibility of separating the database from application programs makes it possible to accelerate the introduction or modernization of information technology tools while dividing work between implementation or support groups.

Economists and managers have at their disposal a powerful arsenal of hardware and software that has become more accessible and sophisticated in recent years. Software - these are operating systems, user shells, auxiliary programs, communication programs, anti-virus programs, text and spreadsheet editors, database management systems, office integrated packages, speech synthesis and recognition programs, software products for distributed information processing, accounting packages, financial packages, software products for planning and forecasting the activities of the enterprise and others, corporate information systems.

## RESULTS and DISCUSSIONS

A database is a set of data organized in accordance with certain rules and maintained in computer memory that characterizes the current state of a certain subject area [1]. The subject area is that fragment of the real world, information about which needs to be stored and used in a specific problem being solved, in a specific type of human activity [2]. The main advantage of using a database can be called the high speed and efficiency of searching for the necessary information from them, the time of obtaining which does not depend much on the total amount of information stored in the database. Any database is characterized by a certain logical and physical organization. Physical organization refers to the way in which data is represented, placed, and stored on a medium. Under the logical one - a way to combine data into records, that is, a model of the structure of the entire set of data.

Between the database data and the users of the system is the database management system. The user's request for access to the database is processed by the DBMS. All existing tools for adding files (tables), selecting, updating data in these files (tables) are also provided by the DBMS. The main task of the DBMS is to provide the database user with the opportunity to work with it without going into the details of work at the hardware level [4]. A DBMS is a kind of intermediary between the logical structure of the data that various applications need and their physical storages. Any DBMS should provide compact data storage (without duplication), optimization of access to them, logical integrity (i.e. consistency) of data, as well as a universal interface that allows you to set the data structure, change and retrieve this data by an algorithm unknown in advance. The key functions of the DBMS include data management in external memory, transaction management, logging, and support for database languages [5].

When creating a database, users try to sort its data according to certain characteristics in order to then extract the necessary information from it. This can only be possible with structured information. Structuring is a set of conventions about how information is presented. Therefore, data can be structured differently. There are network, hierarchical, relational, object-oriented and hybrid database models according to their structure [6]. Among all these structures, the relational structure is often used.

In a hierarchical database structure, the structure has a tree-like representation of data. A characteristic feature of the structure is that a low-level node has only a connection to one higher-level node. The network structure of the database can be considered the complement of the hierarchical structure. In the relational structure of the database, all information is shown in the form of simple tables, which are divided into rows and columns, at the intersection of which the information is located. This structure has become a real leap forward in the development of databases. In object-oriented databases, information is stored in the form of objects, which is very convenient. But at this point in time, such databases are not yet common, because they are much inferior in performance. Hybrid databases combine the functions of relational and object-oriented structures, which is why they are called object-relational. An example of a database management system is Oracle[7].

Consider designing a database using PHP, MySQL and execute queries, read and write data, handle errors. The script that connects to the database, executes the query, and displays the result will only be a few lines long. To work with MySQL, you do not need to install or configure anything additionally; everything you need is already available with the standard PHP distribution. mysqli (MySQL Improved) is a PHP extension that adds full support for MySQL databases to the language. This extension supports many features of modern versions of MySQL.

A typical DBMS process in a PHP script consists of several steps:

- • Establish a connection to the DBMS server by passing the necessary parameters: address, login, password.
- • Make sure that the connection was successful: the DBMS server is available, the login and password are correct, and so on.
- • Form a correct SQL query (for example, to read data from a table).
- • Verify that the request was completed successfully.
- • Get the result from the DBMS as an array of records.

- • Use the resulting records in your scenario (for example, show them in a table).

Before you start working with data inside MySQL, you need to open a connection to the DBMS server. In PHP, this is done using the standard mysqli_connect() function. The function returns a result — a connection resource. This resource is used for all of the following MySQL operations. But in order to connect to the server, you need to know at least three parameters - the address of the DBMS server, login and password. The basic syntax of the mysqli_connect() function is:

mysqli_connect(<server address>, <username>, <password>, <database name>);

The first thing to do after connecting to the DBMS is to check that it was successful. This check is needed to exclude an error when connecting to the database. Invalid connection options, misconfiguration, or high load will cause MySQL to reject new connections. All of these situations will result in a connection failure, so the programmer should verify that the connection to the server was successful before proceeding with the following steps. The MySQL connection is established once in the script and then used for all database queries. MySQL Connection Code and Error Checking.

```
<?php
        $link = mysqli_connect("localhost", "root", "");

        if ($link == false){
        print("Error: Unable to connect to MySQL " . mysqli_connect_error());
        }
        else {
            print("Connection established successfully");
        }
?>
```

With the connection established and the encoding defined, we are ready to execute our first SQL queries. You already know how to write correct SQL commands and execute them through the console or visual interface of the MySQL client. The same requests can be sent without changes from a PHP script. Several built-in language functions will help with this. All SQL queries should be divided into two groups:

- Reading information (SELECT).
- Modification (UPDATE, INSERT, DELETE).

When executing requests from the PHP environment, requests from the second group return only the result of their execution: success or error. Requests from the first group, if successful, return a special result resource. This, in turn, can be converted to an associative array (if one entry is needed) or to a two-dimensional array (if a list of entries is required). The INSERT INTO statement is used to add new records to a database table. Let's write a valid SQL query to insert a record with the name of the city, and then execute it by passing this query to the mysqli_query() function to add new data to the table.

```
<?php
        $link = mysqli_connect("localhost", "root", "");

        $sql = 'INSERT INTO cities SET name = "Tashkent"';
        $result = mysqli_query($link, $sql);
```

```
if ($result == false) {
    print("An error occurred while executing the request");
}
```

For queries to change data (not SELECT), the execution result will be a boolean value - true or false, which will mean that the query failed. The mysqli_error($link) function is available to get a string describing the error. Now we have everything we need to add an entry. Here's what a complex example would look like with connecting to MySQL and adding two new records[6]:

```
<?php
```

For queries to change data (not SELECT), the execution result will be a boolean value - true or false, which will mean that the query failed. The mysqli_error($link) function is available to get a string describing the error. Now we have everything we need to add an entry. This is how it would be $link = mysqli_connect("localhost", "root", "");

```
if ($link == false){
    print("Error: Unable to connect to MySQL " . mysqli_connect_error());
}
else {
    $sql = 'INSERT INTO cities SET name = "Tashkent"';
    $result = mysqli_query($link, $sql);

    if ($result == false) {
        print("An error occurred while executing the request");
    }
    else {
        $city_id = mysqli_insert_id($link);

        $sql = 'INSERT INTO weather_log SET city_id = ' . $city_id . ', day = "2023-05-03", temperature = 10, cloud = 1';

        $result = mysqli_query($link, $sql);

        if ($result == false) {
            print("An error occurred while executing the request")
look like a complex example with connecting to MySQL and adding two new records;
        }
    }
}
```

Another common database operation in PHP is getting records from tables (SELECT queries). Let's create a SQL query that will use a SELECT statement. Then we execute this query using the mysqli_query() function to get the data from the table. This example shows how to display all existing cities from the cities table:

```
<?php
```

```
$sql = 'SELECT id, name FROM cities';

$result = mysqli_query($link, $sql);

while ($row = mysqli_fetch_array($result)) {
    print("City: " . $row['name'] . "; id: . " . $row['id'] . "<br>");
}
```

To get the actual data, that is, records from the table, you should use another function - mysqli_fetch_array () - and pass this link as the only parameter to it. Now each call to the mysqli_fetch_array() function will return the next record from the entire result set of records as an associative array. The while loop here is used to "walk through" all the records in the resulting recordset. The value of the field of each record can be found simply by referring to the key of this associative array. The mysqli_fetch_all($res, MYSQLI_ASSOC) function will return a two-dimensional array with all records from the result of the last query. An example showing existing cities using it[5]:

```
<?php

$sql = 'SELECT id, name FROM cities';
$result = mysqli_query($link, $sql);

$rows = mysqli_fetch_all($result, MYSQLI_ASSOC)

foreach ($rows as $row) {
    print("City: " . $row['name'] . "; id: . " . $row['id'] . "<br>");
}
```

To determine the number of records, the mysqli_num_rows() function will help, which should be passed a link to the query result.

**CONCLUSIONS**

Any area of human activity that is supported by information technology is unthinkable without databases. Databases accumulate and store information, are used to support decision making, acting as complex intelligent systems. Any changes, innovations in the field of hardware and software are reflected in the database. New standards, new technologies, new formats - all this inevitably affects the field of databases. Due to the fact that the use of a database is becoming an integral part of the professional activity of a modern person, the effective use of appropriate technologies and software products - database management systems - becomes even more relevant. The entire modern economy is based on information management. Data is everything, and it is very important to process it efficiently. The scope of the database and DBMS for solving various economic problems is very extensive. Today, organizations are increasingly aware of the need to integrate all types of information, from office documents and spreadsheets to, for example, medical images or geographic data, into daily business processes. A single location and protection of all types of information helps to significantly reduce the cost of storage devices.

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