

**BACK - END DEVELOPMENT**

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# **Introduction**

This report will describe the system for a primary school that is Riston Academy Primary School and the system will be made with the help of PHP and MySQL. In the system, there will be 4 functions class-info, Pupil-info, Parent/Guardian-info, and Teacher-info. After this, a form will be introduced to the user, so the user can fill the form and the data of the form will be stored in MySQL. This report will tell about the ER diagram in which we have four entities with the name Pupil, Class, Teacher, and Parents/Guardians and the report will discuss the advantages of using PHP and MySQL for the backend.

## **ER Diagram**

An ERD diagram generally referred to as Entity-Relationship Model Entity Relationship Diagram shows a relationship between different entities. Entity Relationship diagrams are a graphical representation that is used in database design. Entity Relationship diagram is drawn while designing databases, debugging databases, creating, and patching databases (Rashkovits and Lavy 2021). The components of Entity-Relationship diagrams are Entity, Attribute, and Relation. In general terms:

**1.** Entity refers to an object or a class that represents any person, a concept within a system, or an entity represented by a rectangle in an Entity Relationship diagram. An entity has a weak entity which means when an entity depends on another entity can be referred to as a weak entity, an entity represented by a double rectangle in an Entity Relationships diagram. In the context of a company, an entity can be an employee, manager, etc.

**2.** Attribute describes a property and characteristics of an entity it represents or tells that our entity has which attribute. An attribute is defined in an oval shape. In a company, an entity employee has an attribute like Employee\_id, Designation, Name, Address, Telephone number, etc. These attributes refer to an employee or are related to an employee. There are multiple types of attributes, like a key attribute that represents the main entity, a Composite attribute that is made up of many other attributes, Multivalued attribute that has more than one value. Derived attribute when an attribute is derived from another attribute.

**3.** Relationship which shows or describes the relationship between an entity and how two entities relate. Relationships are represented by the shape of diamonds. one to one relationship is when entities have one relation. One to many relationships, when an entity has the first entity, has more related attributes to the second entity. Many-to-one relationships are when a second entity has a more related attribute to the first one. Many to many relationships when both entities have more than one related attribute (Azzahra and Anggoro 2022).

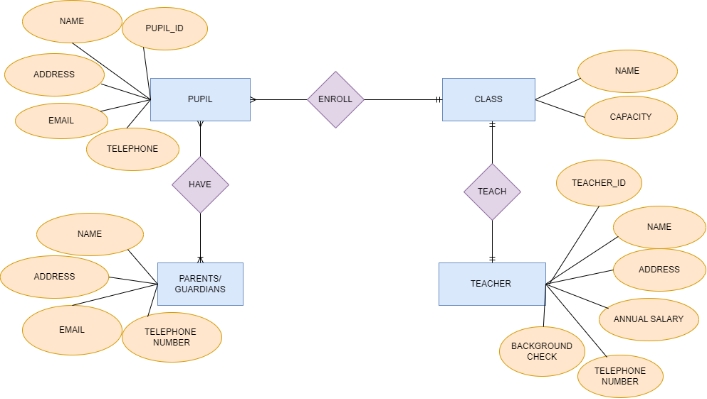


Figure 1: ER diagram

The diagram shown above represents an Entity relationship diagram of a school where a Pupil, Class, Parent/Guardians, and Teacher are the entities represented by a rectangle. Name, Capacity, Address, Telephone, Annual salary, and Background Check are the attributes. Have and Teach shows a relationship.

According to the diagram, Pupils have attributes like Pupil\_id, Name, Address, Email, and Telephone which can enroll in one class at a time and can have up to two parents or guardians. A pupil here refers to a student who has a one-to-one relationship with a class and one or more relationships with Parents/Guardians. The class entity has a name, capacity attributes it can have many pupils up to the class capacity. A class can have only one teacher here, a class and pupil have and one relationship. A class entity has seven classes reception year, first year, second year, third year, fourth year, fifth year, and sixth year. Parents/Guardian entities have a Name, Address, Email, and Telephone as an attribute. A parent/guardians have many children in the same school which can be considered as siblings, this entity has too many relationships with a Pupil. The teacher entity has Teacher\_id, Name, Address, Phone number, and Annual salary as an attribute.

Here a teacher can teach one class at a time so the teacher attribute has one and only one relationship with the entity class. An ER diagram of a school where a Pupil(student) has enrolled in a class that can be taught by one teacher. One teacher can only teach one class at a time and Pupils have up to two parents or guardians and whereas parents can have multiple children(siblings) in the same school.

Structured Query Language (SQL) is used for communication to a database and it allows users to apply or to perform storing, manipulation, and retrieval of the data. The Structured query language allows the user to describe data and to define data in a table and then store it in relation here relation refers to a table. Structured query language commands are divided into groups of four according to their nature these are Data definition language, Data manipulation language, and Data control language. Data Definition language has Create, Alter, Drop or Data manipulation language has Select, Insert, Update, Delete, and Data control language has Grant, Revoke commands included in it. The structured query language is a language for communicating with a Relational Database System. A relational database system means storing related data in a database and then arranging them in a form of a table or relation. Creation of database and then insertion of data, Updation of data, Deletion of data, and then Dropping a table (Ramadina et. al 2023).

Create query is used for the creation of a relation. Insert query is used for insertion of data, Update query is used for updation of existing data, Delete query is used for deletion of data, and Drop query is used for permanent deletion of a relation. By using query functions performed on a database. A database is a collection of data. The queries are:

1. **Query for creation of table**:

1. Create table name (

Column 1 data type,

Column 2 data type,

Column 3 data type,

Column 4 data type );

2.**Query for insertion of the table**:

a.columns will be added in the first insertion query

Insert into table\_name( column1,column2, column3)

Values(values1, value2, value3);

b . No need to mention the column from the second insertion query.

Insert into table\_name values(value1, value2, value3)

3. **Update query**: for updation of query an existing database.

Update column\_name

SET column 1= value1, column 2 = value2

Where condition.

4. **Delete query**: for deletion of an entry from the existing database.

Delete from table\_name where condition.

In the Above entity relationship diagram four tables will be created of Pupil, Class, Teacher, Parents/Guardians, and create query will pass then insert query will be used, and for the update, the query is used and for deletion of data, a delete query will use. For permanent deletion of a table from the database drop query use. Attributes of an entity will become columns of a table and then insertion and further processes will execute. Structured query language can run on platforms like MYSQL, ORACLE, etc. Structured query language will allow users to create and store procedures and functions in the database (Bachtiar et. al 2022).

## **Website functioning and features of PHP and MySQL**

Firstly, when the user opens the Website it shows four functions, the first one is Class-info, the second is Pupils-info, the third is Parents/Guardian-info and the last is Teachers-info. If the user clicks on the Class-info function then the user gets a form in the display, and the form is about the Class name, the capacity of the class, and Which teacher is appointed to this class. Users can only select one teacher for one class if the user selects more than one teacher then the form will not submit and if the user has not filled in the whole details then also form will not submit because it works on the form validation system (Tench and Setter 2021). Same as the Class-info function if the user clicks on the Pupils-info then the user gets the form which includes the details of the Pupil such as Name, Address, Medical information, and to which class the Pupil has enrolled, Each Pupil can only be enrolled to one class if the user selects more than one class then the form will not submit. After this form asks about Parents or guardians and there are only 2 or less than 2 Parents or guardians user can fill in if the user selects more than 2, then again form will not submit. Now, if the user clicks on the Parents/Guardians-info then the form will open, and it will ask about Name, Address, Email, Telephone, etc, and Parents/Guardian allocated to how many Pupils because single parents may have multiple Pupils. Now last if the user runs the Teachers-info then the form will appear and ask about Name, Address, Phone number, Annual salary, and Appointed to class. One teacher can be appointed to only 1 class. After submitting the details of the function this data will be stored in the file with the help of PHP and MySQL. In JavaScript, this program includes an object by which data can be stored in an array or the user can retrieve it by applying some operation on it (Mathew, S.A. et. ul 2022).

This program uses MySQLi language in Php Which connects the PHP form to the database on localhost with the help of the same variables name. Configure on localhost on which the username is “root” so that the connection could be made on the MySQL server.

## **PHP and MySQL for the Backend**

Ans: The Internet used by people world Wide is increasing day by day and for businesses across the globe Websites become an essential part. The most commonly used and Powerful tools for creating Dynamic and robust websites or Web Applications are PHP and MySQL. PHP is a server-side Programming language and MySQL is a Relational database management system (RDBMS) which means the data is stored in tabular form and is developed by Oracle that is based on Structured Query Language (SQL). It is easy to use PHP MySQL application development which is the main reason many businesses use this. Numerous open sources of content management software such as Joomla, Drupal, WordPress, etc PHP have been (Claritus Consulting 2019).

There are some advantages given below:

* **Dynamic:** By using customized features it creates dynamic pages because PHP is a server-side scripting language. Interactive websites or web programs can be done by PHP because it is user-friendly and also enables users to interact with the website.
* **Ease of use:** PHP is an easy language if it is compared to other languages whose work is the same PHP resolves many issues very easily so, it is easy to use and better than others.
* **HTML added codes:** PHP can decode HTML and because of this there is no separate language for PHP. This property has many advantages as given below:
  + - With the help of WYSIWYG editors PHP can easily be integrated into code.
    - By using PHP, it increases efficiency, and cost can be reduced so it is code effective language.
* **Cost-effective:** PHP/MySQL is cost-effective and no need to pay additional after creating a website. It is free and understanding that MySQL/PHP is run perfectly at a low cost (Claritus Consulting 2019).

Portability is the concern of many companies and PHP is interoperability with multiple operating systems and servers, so PHP solves the portability difficulties because of this companies can save money and leverage their resources instead of buying expensive proprietary products. MySQL and Microsoft Oracle both are owned by Oracle Corporation and both are RDBMSs (Relational database management systems) but MySQL is free and open source and Oracle is paid and that’s the biggest reason MySQL is better to use as compared to Microsoft Oracle however Oracle has free version also but for students and not for openly available for everyone and MySQL has also Paid version but many of work can be done by only free version so, these are the benefits of using PHP and MySQL in using backend development (Wolfe 2021).

# **Conclusion**

This report was about the System which is built for a primary school (Riston Academy Primary School) because the school used the note-books for data saving, so a system was made for the school, so they can save their data into a database with the help of MySQL and PHP. The data can be stored in a database by the form for class, Pupil, Teacher, and Parents/guardians. This report tells about the System by ER diagram representation and discussed the advantages of PHP and MySQL, the main advantage is that they are free and open source and others are paid.

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