

# Eloquent Object Relational Mapping in PHP Using Laravel Framework

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**Abstract**—Today we live in the world that is connected by the internet. Many people use internet in their daily basis such as browsing, streaming, and many more. Because of that, web applications are easily found and become a common field of Information Technology. Web applications can be developed by using PHP, Java, Go, and other language. However, to develop the database is not easy and you must learn it first. Object Relational Mapping provides a beautiful and simple implementation with the database. You can use the database without using query because it converts database's record to a corresponding "model" in object-oriented programming language. In this paper, author will give some examples how to use object relational mapping in PHP language using a framework named Laravel. Based on experiments, using object relational mapping in web application is easier than using a traditional way to develop database's web application because there is no need to call queries again and again.

**Keywords**—web applications; PHP; database; object-relational mapping; Laravel

## I. INTRODUCTION

World population statistics March 25, 2017 said there are 7,519,028,970 people and there are 3,731,973,423 internet users in in the world<sup>[1]</sup>. Almost 50% population in the world use internet and certainly they already use a web application. So, web application is a common field in Information Technology and also in our life.

Web application can be developed by programming language such as PHP, Java, Go, NodeJS, Python, and many more. Web application can not be seperated with database because all of web applications need at least a database to save their data. In this paper, author will give some examples with PHP language and Laravel framework.

One of the most popular technique in developing database easier is by using object-relational mapping. In this technique, every record in database are converted to a corresponding "model" in object-oriented programming language. This creates a virtual object database that can be used from within the language. Anyone who uses this technique does not need to learn queries in database programming first. If they want to do

create, read, update, and delete a record in database, they just have to call the model object.

The first object-relational model TopLink was developed in 1994, the Java version in 1996, and the Entity Bean 2.0 in 2001<sup>[2]</sup>. Object-relational mapping emerged in the context of two significant IT trends. First as the cost of commodity hardware plummeted from the mid 1980s onwards and as the heavily hyped ideals of object-oriented programming came into conflict with the well established and proven relational database technology.

In this paper, we will present some examples how to use object-relational mapping in PHP using Laravel framework. By using this technique, we will save our time because it often reduces the amount of code that need to be written.

This paper is organized into four sections. First section is the introduction why object-relational mapping is a good technique to be used by developers. In, the second section will explain some theory about web application, object-relational model, and object oriented. The author will give some examples or case studies in the third section. For the last section, the author will conclude the benefits and the disadvantages of using object-relational mapping.

## II. THEORY

### A. Web Application

Web application is a client-server software application in which the client runs the app in a web browser such as mozilla firefox, internet explorer, google chrome, and opera. Common web applications include webmail, online marketplace, online auctions, online news, wikipedia, instant messaging services, and many other functions. Before developing a web application, you must develop a static web page with html, css, and js. Nowadays, web application is developed by a framework within a programming language.

### B. Object Oriented Programming<sup>[3][4]</sup>

Object-oriented programming is a paradigm in programming on the concept of objects which can have data, fields often knowns as attributes, methods, functions, and

codes. A feature of objects is that an object's procedures can access and often modify the data fields of the object with which they are associated. In object-oriented programming, computer programs are designed by making them out of objects that interact with one another. The advantages of using object-oriented are encapsulation, inheritance, polymorphism, and abstraction.

### C. Object Relational Mapping<sup>[5]</sup>

Object-relational mapping is a programming technique to convert data from record in database to a model class in object-oriented programming languages. This technique creates a virtual object database that can be used and called from within the programming language. Programmers don't have to call queries again and again if using this technique so they can reduce the amount of code that needs to be written.

This is a simple example how easy to use this ORM technique.

Usually programmer need to write this code to connect database to programming language

```
<?php
.....
$sql = "SELECT * FROM persons WHERE id = 7";
$result = $conn->query($sql);
.....
?>
```

With ORM technique, programmer just need to write this code

```
<?php
.....
//find a specific person model by id
$person = Person::find(7);
.....
?>
```

#### Person model

```
<?php
.....
class Person extends Model {
    protected $table = 'person';
    protected $primaryKey = 'id';
    protected $fillable = array(
        'name',
        'age',
        'gender',
        'address');
    .....
}
```

Laravel framework will handle all process to connect database and web application. Object-relational mapping is faster than traditional database access because programmers only make the model once and they can make a model and access a record from database without using queries.

### III. CASE STUDY WITH AN EXAMPLE

In order to learn how object relational mapping in Laravel you need to:

1. Install PHP and Database language
2. Install Composer for PHP
3. Install laravel with this code :

```
composer install --prefer-dist
```

4. Change the database setting in app/config/database.php

### 5. Make a Laravel migration

### 6. Create Models

#### A. Make a Laravel Migration

We need to migrate our database to make tables and attributes to become structure in database.

First, we need to launch a command via command line with this command

```
php artisan migrate:make create_customer_table --create=customers
```

This will make a migration file and you need to in and add the file's fields to become this code

```
<?php

use Illuminate\Support\Facades\Schema;
use Illuminate\Database\Schema\Blueprint;
use Illuminate\Database\Migrations\Migration;

class CreateCustomerTable extends Migration
{
    public function up()
    {
        Schema::create('customer', function
(Blueprint $table) {
            $table->increments('id');
            $table->text('number');
            $table->dateTime('reg_date');
            $table->text('name');
            $table->text('address');
            $table->text('fix_phone');
            $table->text('mobile_phone');
            $table->text('email');
            $table->text('npwp');
            $table->text('deleted');
            $table->text('remark');
            $table->bigInteger('dummy_number');
            $table->bigInteger('number_x');
            $table->text('referer');
            $table->text('ref_append_process');
            $table->timestamps();
        });
    }

    public function down()
    {
        Schema::dropIfExists('customer');
    }
}
```

```
}  
}
```

```
$Customer->number = '123';  
$bear->name = 'Adi';  
.....  
$bear->save();
```

Now we need to migrate this to database with this command via command line and Laravel will do the migration.

```
php artisan migrate
```

## 2. Reading Records

```
$customer = Customer::all();  
//will find id 123  
$customer = Customer::find(123);
```

## B. Create a Model

We have migrated our database what we need to do right now is create a corresponding model. The model files will be saved in folder app/models/

## 3. Update Records

```
$customer = Customer::find(123);  
$customer->name = 'Budi';  
$customer->save();
```

```
<?php  
  
namespace App;  
use Illuminate\Database\Eloquent\Model;  
  
class Customer extends Model {  
    protected $table = 'customer';  
    protected $primaryKey = 'id';  
    protected $fillable = array(  
        'number',  
        'reg_date',  
        'name',  
        'address',  
        'fix_phone',  
        'mobile_phone',  
        'email',  
        'npwp',  
        'deleted',  
        'remark',  
        'dummy_number',  
        'number_x',  
        'referrer',  
        'ref_append_process');  
}
```

## 4. Delete Records

```
$customer = Customer::find(123);  
$customer->delete();  
//or  
Customer::destroy(123);
```

## C. CRUD with ORM

We have already done all the preparations. This are some examples how to create, read, update, and delete with this technique.

As we can see, to do CRUD with object-relational model we just need to write two or three lines of code. This is easier than traditional way and will save our time also reduce our program's lines of code.

## IV. CONCLUSION

Object relational mapping provides a beautiful and simple activerecord implementation with database. Each database table has a corresponding model which used to interact with the table. This technique will convert a record to a model class in object-oriented programming language. Compared to traditional technique to access and do CRUD in database, this technique is easier and often reduces the amount lines of code that needs to be written by programmer. Nevertheless, this technique have some disadvantages. First, the programmer doesn't know what is actually happening in the implementation code. Second, heavy reliance on object-relational mapping software will produce a poorly designed database. It is still a necessary for programmer to learn how to design a good database and how to do queries in database.

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## 1. Creating Records

```
Customer::create(array(  
    'number' => 123,  
    'reg_date' => '05/02/2017',  
    'name' => 'Adi'  
    'address' => 'Jalan Teuku Umar no 27'  
    .....  
));
```

## REFERENCES

- [1] <http://www.internetworldstats.com/stats.htm> retrieved May 4, 2017 on 11:11.
- [2] <https://antoniogoncalves.org/2008/09/27/a-brief-history-of-object-relational-mapping/> retrieved May 4, 2017 on 12:04.
- [3] Kindler, E.; Krivy, I. (2011). "Object-Oriented Simulation of systems with sophisticated control". International Journal of General Systems: 313-343.

Or

```
$Customer = new Customer;
```

- [4] Lewis, John; Loftus, William (2008). Java Software Solutions Foundations of Programming Design 6th ed. Pearson Education Inc. ISBN 0-321-53205-8., section 1.6 "Object-Oriented Programming.
- [5] <http://hibernate.org/orm/what-is-an-orm/> retrieved May 4, 2017 on 16:57.

STATEMENT

I hereby declare that this paper is my own paper, not an adaptation, or a translation from someone else's paper, and not a plagiarism.

Bandung, May 4 2017

A handwritten signature in black ink, appearing to read "Joshua Salimin", written over a horizontal line.

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