Prototype of a web-based research product management system using the Yii2Framework

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Resumen

El objetivo principal del trabajo es crear un sistema web desde cero que consistirá en un tipo academia, o conservatorio virtual donde los usuarios (según su rol) podrán crear, y/o unirse a cursos, manuales, proyectos, y videotutoriales, algunos serán de paga y otros gratuitos. El software le dará al usuario la posibilidad de elegir el producto que le convenga y podrá pagar en línea a través del método de pago PayPal.

El sistema se creará utilizando el Framework Yii2 por lo que utiliza un patrón MVC ya que ayudará a la organización de los datos e información imprescindible para el sistema.

También se muestra parte del porque se crea el sistema, y el beneficio que cualquier usuario, tanto jóvenes estudiantes como instructores podrían tener acceso a revisar temas de interés o alguna duda que tengan. En este caso también se ponen los objetivos con las tareas a cumplir. Luego se habla de que es Yii2 y su patrón MVC que trae por defecto, así mismo se explica que el proyecto se encuentra en desarrollo con las herramientas necesarias desde la creación de base de datos, hasta la realización de interfaces donde el usuario interactuará con el dónde se muestra la mejoría de la interfaz gráfica que trae por defecto Yii a modificarla con plantillas editadas con Bootstrap y CSS.

Abstract

The main objective of the work is to create a web system from scratch that will consist of an academy type, or virtual conservatory where users (depending on their role) will be able to create, and/or join courses, manuals, projects, and video tutorials, some will be paid and others free. The software will give the user the possibility to choose the product that suits him/her and will be able to pay online through the Paypal payment method.

The system will be created using the Yii2 Framework so it uses an MVC pattern as it will help the organization of the data and information essential for the system.

It also shows part of why the system is created, and the benefit that any user, both young students and instructors could access to review topics of interest or any questions they have. In this case, the objectives and tasks to be accomplished are also presented. Then we talk about what Yii2 is and its default MVC pattern, and we explain that the project is under development with the necessary tools, from the creation of the database to the creation of interfaces where the user will interact with it, where we show the improvement of the graphical interface that Yii2 brings by default to modify it with templates edited with Bootstrap and CSS.

1. INTRODUCTION

Currently digital technology is more adhered to the various daily activities such as business, science, sports, politics, etc. Of course, the educational theme is considered to have more interaction with information technologies since within them there is a diversity of tools that the student or educational instructor uses for the development of their knowledge and work.

It is of general knowledge that there are problems, so the student or instructor must make use of platforms or systems in the educational development or work, and for a long time have been making use of this diversity of digital tools, but sometimes not being specific to the objectives of work being done is very complicated its use. It is considered that, to help solve this type of situation, a system should be created that is specifically aimed at the development of educational or research work, and this is what is proposed in the following article.

Likewise, it is not superfluous to create systems or software that continue to facilitate the educational development of students, since, with the evolution and emergence of more systems for this purpose, the student or researcher will be able to provide them with greater efficiency, solution to their various investigations or personal concerns.

The creation of this system will focus on the following objectives:
- Carry out work plan.
- Design database
- Develop graphical interfaces:
    o Course module.
    o Manuals module.
    o Projects module.
    o Video tutorials module.
    o Blog module.
- Server configuration.
- User manual and technical manual.

2. WHATS IS ORGANIZATIONAL MANUAL OF THE GENERAL DIRECTORATE OF INFORMATION AND COMMUNICATIONS TECHNOLOGIES?

Provides information and communication technology solutions and services in an efficient and effective manner, generating value through quality processes to support SEP's mission and objectives, innovating with a focus on services using methodologies that incorporate best practices and optimizing the use of resources (Publica, 2018).

Provides excellent services to meet the expectations of our users in relation to Information Technologies, complying with the current standards and with the commitment to have a Quality Management System and improvements (Publica, 2018).

3. WHATS IS THE FRAMEWORK YII2?

Yii is a high-performance, component-based PHP framework for developing modern web applications in a short time. The name Yii means "simple and evolutionary" in Chinese. It can also be considered as an acronym for Yes It Is. (YiiFramework, 2022).

Yii is a web programming framework, which means that it can be used to develop all kinds of web applications in PHP. Due to its component-based architecture and sophisticated caching support, it is especially suitable for

developing large-scale applications, such as websites, forums, content management systems (CMS), e-commerce projects, REST-compliant web services and many more. Like most PHP frameworks, Yii implements the MVC (Model-View-Controller) design pattern and promotes code organization based on this pattern. (YiiFramework, 2022).

There are currently two main versions of Yii: version 1.1 and version 2.0. For version 1.1, which is from the previous generation, only maintenance is currently provided. Version 2.0 is completely rewritten and adopts the latest technologies and protocols, including Composer, PSR, namespaces, traits, etc. Version 2.0 represents the current generation of the framework and its development will receive the main effort in the coming years. This guide is mainly based on version 2.0 of the framework. (YiiFramework, Read the Docs, 2022).

4. WHAT IS MVC?

It is a style of software architecture that separates an application's data, user interface, and control logic into three distinct components. It is a very mature model that has proven its worth over the years in all types of applications, and on a multitude of development languages and platforms:

- The Model that contains a representation of the data handled by the system, its business logic, and its persistence mechanisms.
- The View, or user interface, which composes the information sent to the client and the interaction mechanisms with the client.
- The Controller, which acts as an intermediary between the Model and the View, managing the flow of information between them and the transformations to adapt the data to the needs of each one. (Universidad de Alicante, 2022).
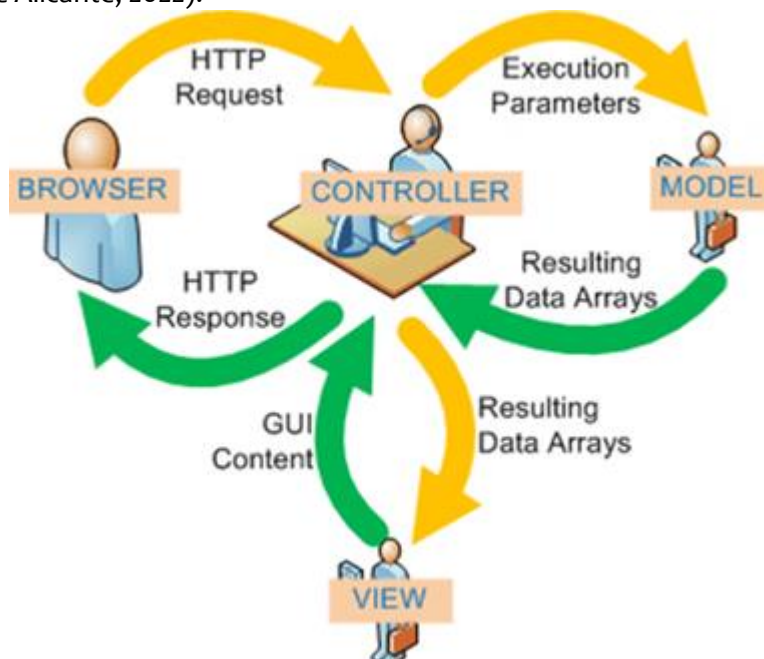

Figure 1. Control flow that integrate the MVC.

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The three components of MVC are interconnected. The view displays the model to the user, then the controller accepts the user input and updates the model and due to this action the view again has a change with the updated data. This design pattern is one of the most used nowadays. There are many frameworks in different languages that use MVC, such as Yii2 for PHP, Django for Python, Ruby on Rails for Ruby, Express for NodeJS and others. (Easy App Code, 2022).

5. CREATE DATA BASE

For the creation of the database, it is necessary to have a virtual server installed, in this case the WAMP is used, by default it brings Apache and MySQL, likewise it can be used in Windows operating systems, it also brings the PHP language. Next, it is shown the tables that are being used in the database for the system that is made of the academy.

archivo
auth_assignment
auth_item
auth_item_child
auth_item_group
auth_rule
curso
cursocategoria
cursocomentario
cursocontenido
cursoestatu
cursosubcategoria
cursotema
cursotemaarchivo
cursotemavisita
cursousuario
foro
foroestatu
foropregunta
fororespuesta
galeria
galeriaarchivo
galeriaestatu
manual
manualcategoria
manualcomentario
manualestatu
manualsubcategoria

Figure 2. Tables of data bases

manualtema
manualtemaarchivo
manualtemavisita
manualusuario
migration
nota
notaarchivo
notaestatu
notafoto
proyecto
proyectoarchivo
proyectocategoria
proyectoestatu
proyectosubcategoria
tipoacceso
tipomaterial
user
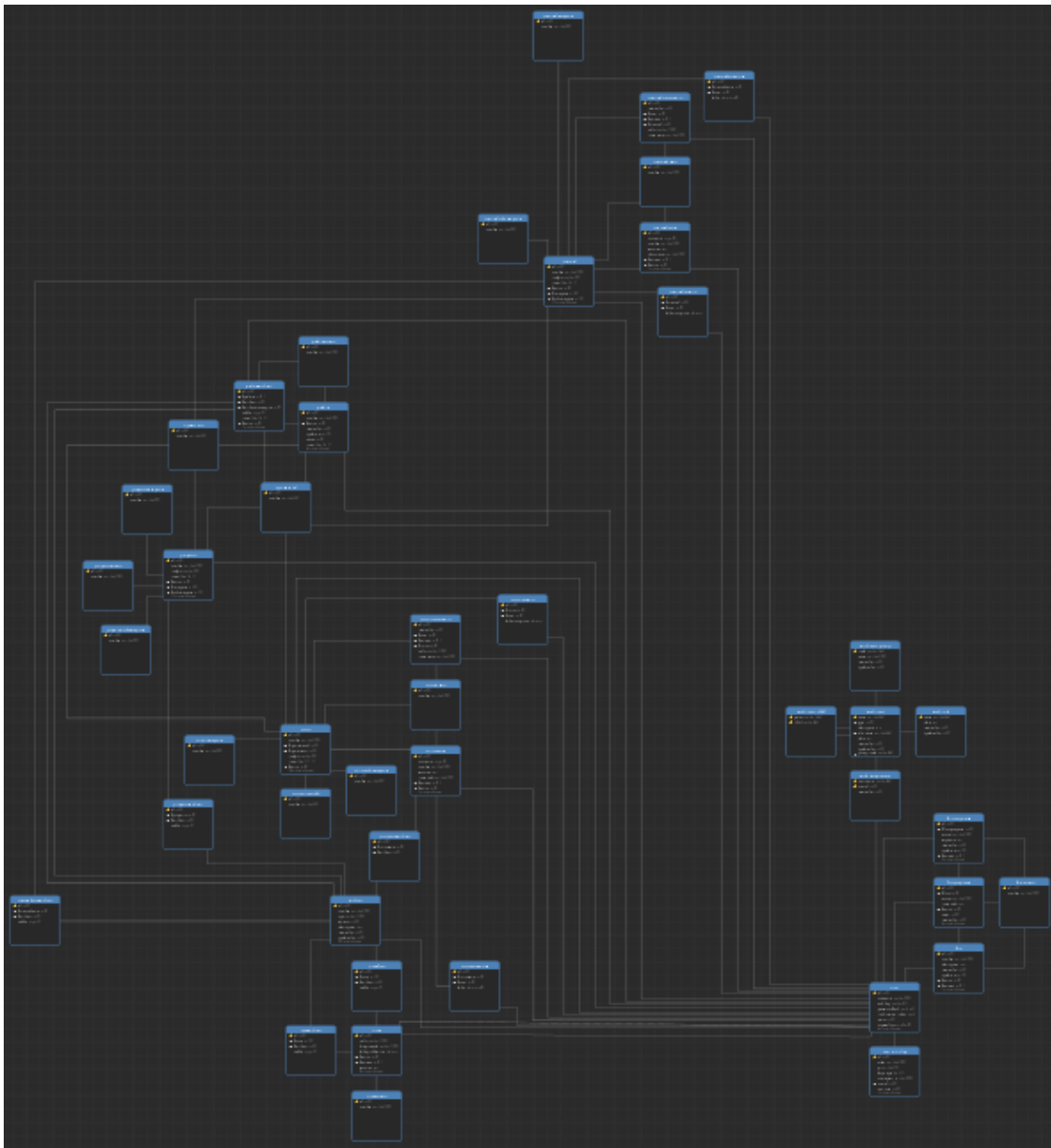user_visit_log

Figure 3. Tables of data bases

Figure 4. Entity-relation diagram

6. WEB SYSTEM IN PROGRESS WITH FRAMEWORK YII2

To obtain the main template in which you can work with the MVC that comes with Yii2 by default, first install composer, since it is a php package that provides many dependencies and libraries.

After downloading the executable (composer.exe), open it as administrator and continue clicking next until the installation is finished.

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Figure 5. Installation of composer with its version

Taking advantage that the cmd remains open, inside the folder where the wamp projects are stored c:\wamp64\www a folder must be created with the name of the work to be done, in my case it was put with the name of school.
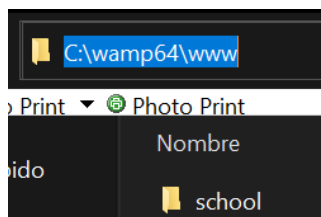

Figure 6. Creation of the School folder

Once the folder where the project is stored has been created, the following commands are entered in the cmd, which will download the necessary packages at the end.

- composer create-project --prefer-dist yiisoft/yii2-app-advanced yii2-school
- php init
- create the database and connect to the information in the database in common/config/main-local
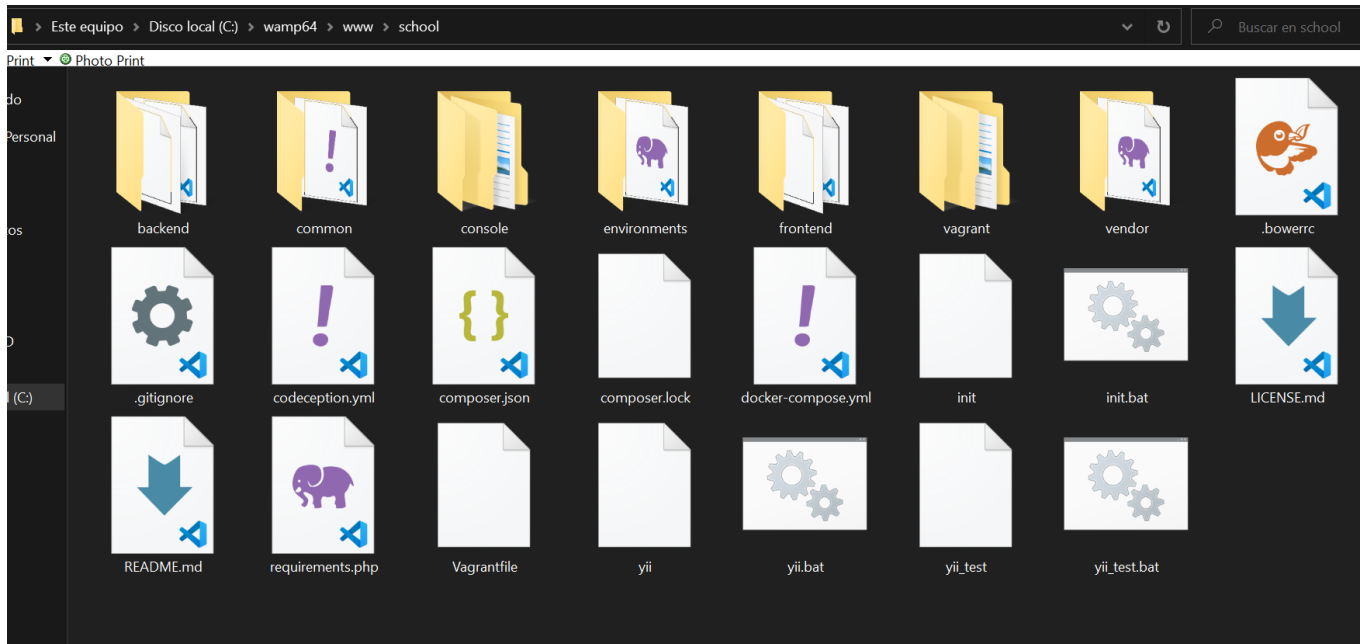- php yii migrate

Figure 7. The project template is created

Once the project is created, it can be verified by starting the index that is located in the path C:\wamp64\www\school\web\index.php when it is opened, it shows the main page in figure 8.
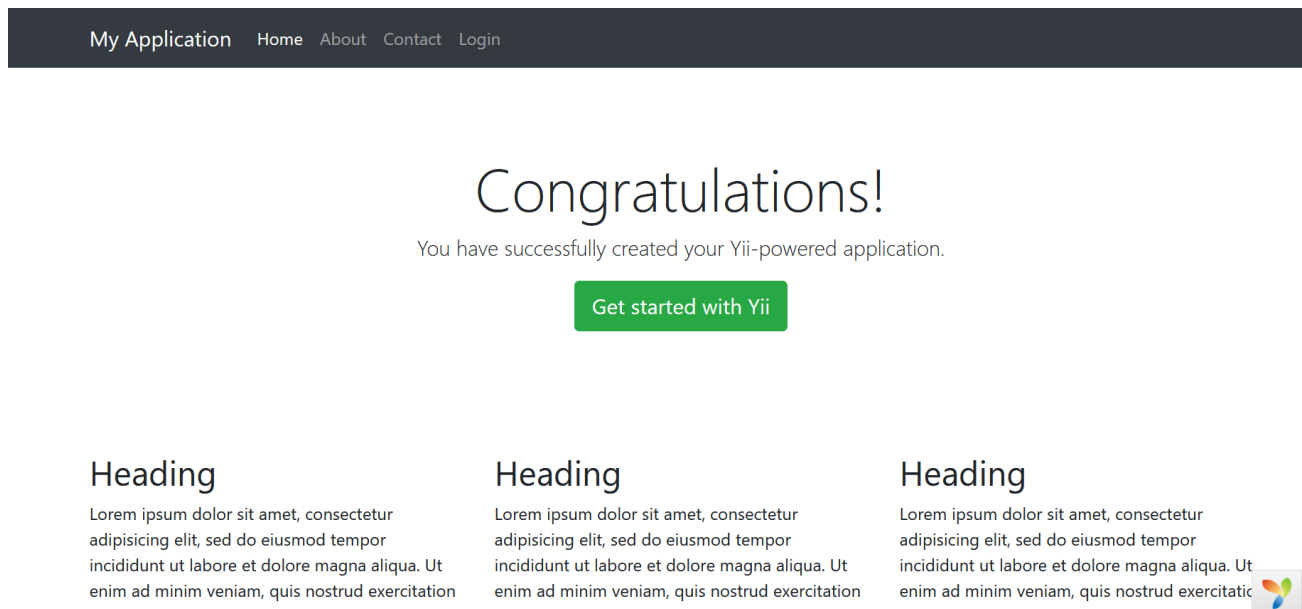

Figure 8. Index of project school without modify

So that the beginning does not look simple, the search for templates is done. A template is a basis for creating pages with a sketch similar to the one we want to create, but the content is modified as the client requires. The advantage of using Yii is that the libraries of the new templates that are used are adapted to the way the project works. Figure 9 shows the change from the default login to a modified one.
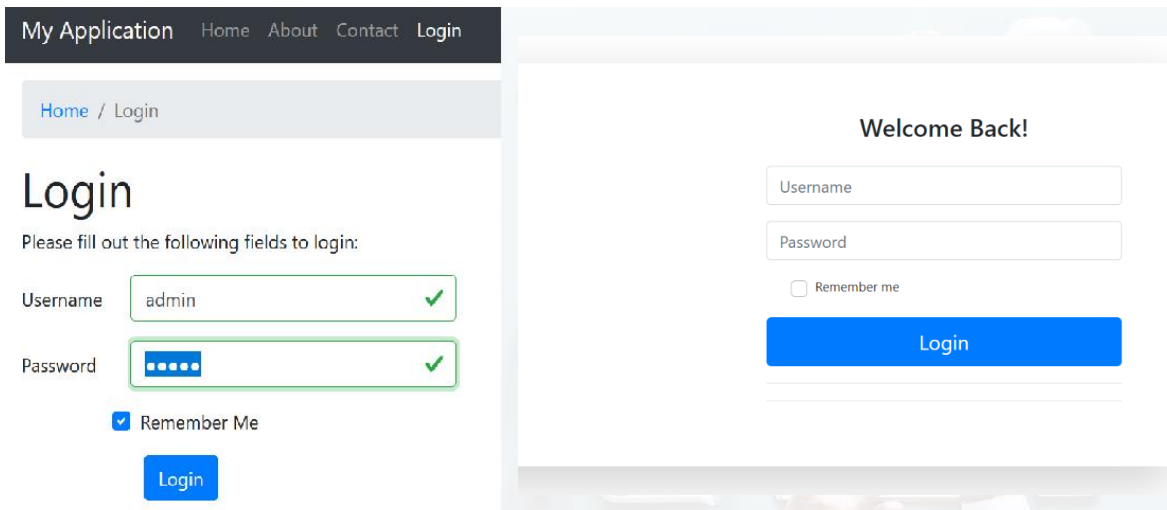
Figure 9. Login comparison

7. CONCLUSIONS

The project is very extensive, so it is currently under development, thanks to the new technologies that exist, the systems that are made are possible to be done, as well as the software automate things in the place that are implemented.

Here you see the importance of using a complete framework (full stack) that provides many utilities such as relational databases (SQL) to customize each part of the system to your liking.

In the work so far we reach to use different methods to create a module in the web system, thanks to the MVC model mentioned above, with which you can make the views and controllers having the data first in MYSQL.

The installation of Yii was feasible thanks to the manuals given by the platforms nowadays, besides using it is not difficult since there are guides to facilitate the use of the framework. The use of other templates was also implemented to change the design of the interfaces.

Finally, I recommend using the existing frameworks because they speed up the creation of a new web system, providing the structure and functionalities, as well as reducing the amount of errors when coding.

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