**EASTERN MINDANAO COLLEGE OF TECHNOLOGY**

**SCHOOL WEBSITE ONLINE STUDENT AND FACULTY PORTAL**

**A Research Paper**

**Presented to the Faculty of**

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**Chapter I**

**The Research Problem**

**Introduction**

All higher-education institutions face a lot of challenges, especially school management & governance, parent relations, publicity, service education, and teacher support. It has been quite a hassle for school management during the last decade to administer the needs of students & parents with needs from the school. It is okay to administer a few people, but when you need to administer groups of people, ranging from hundreds to thousands, it could be quite taxing to handle, requiring lots of manpower & resources. All academic higher institutions are looking for ways to bring up the best learning environment for their students such as leveraging the use of technology effectively, essential for modern education.

The emergence and advancement of the Internet brings a lot of change to our lives, especially corporations and academic institutions. The biggest example of this is the implementation of school portals to facilitate the needs of students, such as their inquiries, enrollment for the semester, etc. This brings a lot of convenience and ease not only to students, but also to staff. School Portals have a lot of functions; grade evaluation system, enrollment, subject management, etc. This relieves the burden of students to inquire on their grades and subjects, and for the staff to inquire regarding their subject loads, etc.

According to the results of studies by Iver et al. (2021), low-cost interventions using text messages as well as “snail mail” to facilitate communication with families about student progress can yield significant improvements in secondary student attendance and performance. Timely communication with parents regarding their children’s performance and missing outputs can help parents provide the necessary encouragement and reminders to their children, making a difference in whether their children pass or fail the grade.

Grepon et al. (2021) highlight that one of the most common problems encountered by their school at the end of each semester is the student enrollment process. This process typically lasts 2-3 weeks, primarily because most admission tasks and the storage of student information are conducted manually. This manual approach is highly time-consuming and often fails to accommodate the entire population of enrollees within a single day. As a result, the school can only ask for the students' patience and may have to request them to return the next day, which can negatively affect their overall perception of the institution.

Eastern Mindanao College of Technology still employs this manual registration of enrollment which includes manual writing of the required information and details in the registration form, creating lots of paper works which is very time-consuming and expensive to maintain.

The proponents have designed and developed a School Portal for Eastern Mindanao College of Technology (EMCOTECH). This study is focused on addressing the needs of students, and faculty. The study is expected to significantly streamline the school’s administrative processes, reducing the burden on both staffs and students. By making use of the internet, the students can now access the portal to enroll in classes, check grades, removing the lengthy process of manual processes.

**Theoretical Framework**

Numerous important theories and models pertaining to information systems management and educational technology establish the theoretical foundation for this study. These studies can aid in giving background information and a basis for understanding how Eastern Mindanao College of Technology instructors, staff, and students can benefit from a web-based portal in their educational endeavors.

**Input Process Output (IPO) Model**

In planning and designing the flow of the system, the Input-Output-Process (IPO) Model is employed. It is a very useful framework in systems design and analysis to represent the flow data within a system. It is also useful in planning and structuring complex systems by breaking down each component into three essential stages: input, process, output. A system is based on Input-Process-Output (IPO model). Manual work can be replaced by computerized system for accuracy, and speed of processing. Before the development of any computerized system, developers should also understand all basic concepts or details, and requirements of the system. To develop a system, a standard methodology must be considered. The IPO model breaks down complex systems into three essential stages:

* **Input:** The data, materials or resources that are introduced into the system
* **Process:** The transformation of input into a desired output throughout a series of steps in procedure
* **Output:** The final product or result generated by the system.

**Frameworks**

Nawalagatti et al. (2021) implies that a framework is a structural representation of what types of projects you can or need to build and how they are interconnected. Some computer system frameworks include native programs, define programming interfaces, or provide coding tools for using the framework. The authors also implies that Laravel is a web application framework with elegant and expressive syntax. They believe that for growth to be satisfying, it must be an enjoyable and creative experience. Laravel tries to reduce development problems by reducing common tasks used in most web projects, such as:

* Simple, fast routing engine
* Powerful dependency injection container
* Multiple back-ends for session and cache storage
* Strong background job processing
* Real-time event spreading

Laravel has lower learning curve in contrast with Symfony framework as Symfony framework are widely used to build complex web applications while Laravel is used to build simple to intermediate applications.

**Conceptual Framework**

The research aims to develop and contribute a Web-based School Portal for Eastern Mindanao College of Technology, aimed at eliminating the necessity for students to visit the registrar's office to view their grades, thereby streamlining and enhancing inquiry processes.

How are students affected by the absence of a portal?

How to design the algorithms to address the needed functionalities.

How to create a reliable database schema to accommodate ever changing class schedules, or new classes?

How to integrate existing school systems and databases with the new web application to ensure seamless data migration and compatibility?

INPUT

A fully functional online student and faculty portal that allows seamless access to essential academic services such as student enrollment, class scheduling, grade viewing, course management and prerequisite enforcement for course enrollment.

OUTPUT

PROCESS

EASTERN MINDANAO COLLEGE OF TECHNOLOGY

SCHOOL WEBSITE ONLINE STUDENT AND FACULTY PORTAL

OUTPUT

* A streamlined process for recording and managing attendance, saving time, and immediate updates and access to attendance records.
* Automated score results, ranking for games and search tabulation, and e-voting.
* Automated computation for fees and billings of attendance.

**Statement of the Problem**

The Eastern Mindanao College of Technology currently face several challenges in its academic processes, primarily due to reliance on manual systems. This includes student registration, scheduling, and course management Additionally, a lack of systematic oversight in course sequencing has led to students occasionally enrolling in advanced classes without completing foundational courses. This lack of prerequisite enforcement can hinder student comprehension and success in more complex and advance courses. All data must be preserved in a database for future reference and development. The specific problems are detailed below;

1. How are the students affected by the absence of a portal?
2. How to design the algorithms to address the needed functionalities?
3. How to create a reliable database schema to accommodate ever changing class schedules, or new classes?
4. How to integrate existing school systems and databases with the new web application to ensure seamless data migration and compatibility?
5. How can the system ensure that students meet prerequisites before enrolling in advance courses?

**Objectives of the Study**

The main objective of this study is to develop a comprehensive web application that addresses the current challenges faced by Eastern Mindanao College of Technology in its academic processes. The goal is to streamline course management, and enforce prerequisite requirements to improve student experience. This study aims to create a reliable school portal that enhances administrative efficiency, ensure proper course sequencing, offer online services for students, and integrates with existing system while preserving all data for future references.

Specifically, the study aimed to:

1. Develop a centralized student portal that will allow students to access their academic records, class schedules, and other school-related services online, minimizing the need for manual processes and physical interaction with administrative staff.
2. Design efficient algorithms that will address the needed functionalities such as user authentication, role implementations, facilitating seamless interaction between student and staffs.
3. Create and design a flexible database schema that can accommodate ever-changing class schedules and the introduction of new classes.
4. Review database schema of existing school database and implement additional improvements to the planned database design
5. Develop an automated course validation system that verifies whether students have completed the prerequisite courses before enrolling in advanced classes.

**Significance of the Study**

This study is beneficial to the following individuals, foremost of which are as follows;

*School Administration* – By automating tasks like course registration, enrollment, and data maintenance, the built online application dramatically reduces the administrative load on school staff. Administrators can more efficiently deploy resources to projects for institutional and academic advancement as a result of the administrative responsibilities being streamlined.

*Students –* The students highly benefited from this study as they are now free from the burden of having to communicate with related personal regarding their queries and problems regarding school as they can now do it online.

*Teachers* – The project will bridge the gap in the communication between the students and the teachers. This also allows educators to deliver more effective, tailored assistance and feedback. With the help of various functionalities such as grade entry, viewing, and communication channels, teachers can now engage with students in real time, monitoring their progress and tailor specific instructions to meet different individual learning needs.

Parents – The project improve accessibility to educational materials and information, which highly benefits the parents. For parents, the school website is a great resource for parents as it provides them with essential information that can help them make informed decisions about the best school for their children’s overall development. The study fosters positive community interaction and support for educational programs by allowing queries and offering clear access to school-related information.

Future Researchers – The results of this study will benefit other or future researchers in conducting their study about student and faculty portal as they will serve as a guide.

**Scope and Limitation**

This study focuses on the development and implementation of a web-based school portal for Eastern Mindanao College of Technology. It specifically addresses the functionalities related to viewing of grades, and online enrollment for continuing students. The school portal is designed for internal use by students, faculty members, and staff, while the website is accessible to the public. This study is limited only to the functionalities outlined, excluding any additional features beyond the scope of viewing grades and facilitating online enrollment for returning and continuing students. It is imperative to note that the study does not claim to encompass or manage all administrative tasks of the institution.

**Definition of Terms**

The following terms are defined to aid in having a full understanding regarding this study.

*Web Application* – We created this portal as a web application to be accessible to anyone that is connected to the internet.

*Web Portal* - A Web portal or public portal refers to a Web site or service that offers a broad array of resources and services, such as e-mail, forums, search engines, and online shopping malls. The first Web portals were online services, such as AOL, that provided access to the Web, but by now most of the traditional search engines have transformed themselves into Web portals to attract and keep a larger audience.

Laravel - A mature, free, and open-source free web application that can help you build web applications fast. It was created by Taylor Otwell and intended for the development of web applications based on Symfony, a much older framework ideal for building web applications with complex learning curve and is not ideal for beginners.

Symfony – is a set of PHP components, a web application framework and is the leading among PHP frameworks to create website and web applications.

**Chapter II**

**Review of Related Literature and Studies**

This chapter presents different compilations and related topics that are relevant to Eastern Mindanao College of Technology School Website Online Student and Faculty Portal.

**Background of the Study**

The Eastern Mindanao College of Technology is committed to improving and bringing the best learning environment by aligning itself with contemporary educational standards. In pursuant of this goal, the institution is embarking on a comprehensive modernization initiative. This goal is driven by the institution’s dedication in providing an enhanced educational experience that effectively caters to its stakeholders, including students, faculty members, administrative staff, and other relevant individuals. With this goal, the proponents designed and will develop the Eastern Mindanao College of Technology School Website Online Student and Faculty Portal. This innovative web application will serve as a digital platform that shall be accessible to all stakeholders, facilitating seamless interaction, and fostering effective communication channels.

The proponents have observed a laborious enrollment process especially for returning and continuing students. In response to this challenge, the proponents have proposed the introduction of online enrollment process for old students. The implementation of portal’s functionalities can alleviate the burden of registrar from entertaining inquiring students from viewing their grades and can focus them on a more productive work.

**Related Literature**

To achieve overall goals and demonstrate overall relevance, every part of the research project must be integrated with previous academic works. As a result, the review of previous research serves as a crucial connection between the suggested study and the corpus of existing research.

**Online Enrollment Systems**

According to Hayagan (2022), online enrollment has always offered convenience and efficiency, especially when today’s parents are busier than ever and cannot afford a time to accompany their children to enroll on their respective schools. The benefits of online enrollment system are not limited to just parents. Administrators and students also benefit from these systems. Hayagan also stated that web application not only supports PC / laptop-based display but also devices with much smaller screens such as mobile phones and PDA. The grow of the diversity of gadgets provides portable access for overseas and local students regardless where they are and what device they are using.

Moreover, an online enrollment system plays a crucial role in supporting population growth, by facilitating the storage, access, and retrieval of student, and enrollee data. It serves as an essential tool for managing information related to students and enrollees, providing an efficient and reliable resource for school administration.

**Student Portal**

According to Sakthivel, Krishna (2022), student portal is a web portal where all information and services that students need can be found in one place. Students now can interact with the online platform provided to them for seeing the activities like exam marks, internals, and Time table. It might be one of the best ways to use technology for the benefit of students.

Iver et al. (2021) concludes that their interactions with the school and district leaders during this four-year partnership project help them understand why the gaps in portal access were so wide, and what schools could do to connect more of their families to this important resource.

Bergman (2016, 2019) has conducted the most extensive work using parent portal login data, documenting differences in portal use by ethnicity and income status which are likely related to access to the internet and computer technology. He noted increased usage at schools where information on the portal was updated more frequently. His experimental studies show a small positive impact of “nudges” using phone calls and letters to families to encourage use of the parent portal on the frequency of parent login to a portal. He also found a significant positive effect of the nudge to increase portal use on student grades (Bergman, 2019). Another study (Mac Iver et al., 2020) provides evidence that parent portal usage is associated with lower odds of ninth grade course failure, even when controlling for prior failing grades in the same year and other covariates associated with course failure.

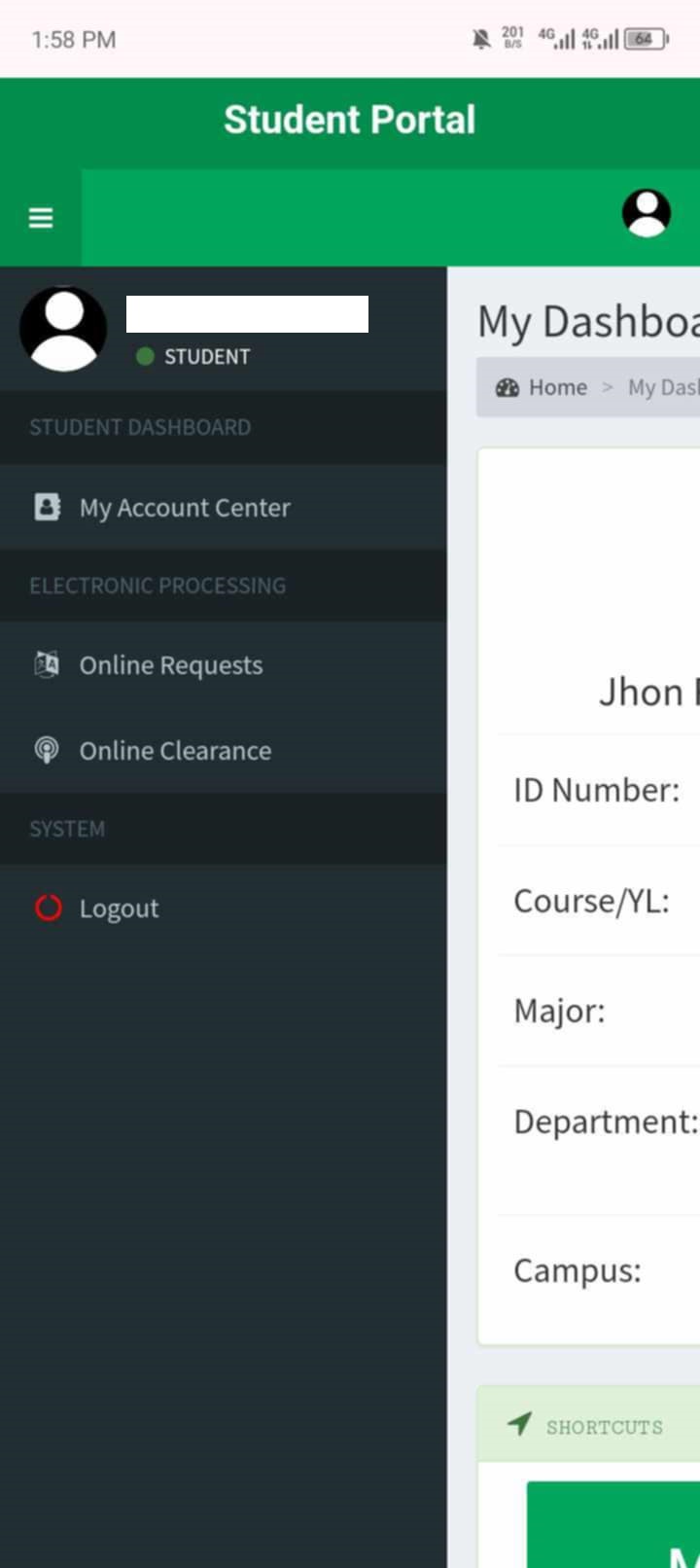
**Related Studies**

**School Portal**

The findings of the studies of Iver et al. (2021) indicated that a large population of parents have never logged in to the system. Their analysis identified five major components of the experience. Families need to: 1) understand what the portal is and why it is useful; 2) get account login permission to obtain access; 3) be able to login to the portal regularly; 4) understand the information on the portal; and 5) take steps to use that information effectively to support their child’s success in school. These components can be viewed as an overarching flowchart of the process of building family capacity for using the portal to support their children’s academic success. They are illustrated graphically in Figure 1 and discussed in turn below. But most parents stop at the 2nd component. An example was on one high school information night for perspective families that they attend, they noticed that the “Guide to Information Available” handout simply mentioned that “Information on the [Name of District Portal] is available in the library.”. The portal in the district had an ambiguous name, and if one did not know what it was, one probably would not have sought further information. Even if one made the effort to find the school library. A persistent parent might have waited to speak to the staff member in the library to ask about how to get access to and use the portal, but most would not like these steps and choose to ignore. School staff may not have considered that some families (and immigrant families) may have no idea of what a portal is and need a vivid description of how the tool can be useful to them and a demonstration of what it can do. They may need a sign that invites them to a session on “Helping Your Child to Be Successful,” an overview of the information on the portal, and the promise of a hands-on demonstration.

**Jhcsc.edu.ph – J.H Cerilles State College School Portal**

The J.H. Cerilles State College is a public college in the Philippines. Its main campus is located in Mati, San Miguel, Zamboanga Del Sur. It has 4 campus and one extension classes; Main Campus, Dumingag Campus, Canuto MS Enerio Campus, Pagadian Annex Campus. It offers 12 Bachelor Courses and 3 Master’s Courses



**Rationale**

The gathered higher-education institutions websites are the basis of the researchers to come up with the study. Eastern Mindanao College of Technology lacks comprehensive online services highlighting a gap in digital infrastructure that the study aims to address, which is crucial for streamlining academic and administrative processes. Studies like Bagwan et al. (2019) demonstrate how modern frameworks such as Laravel can enhance security and efficiency in web development, providing a model for EMCOTECH in building robust online services.

A web portal can improve engagement by providing students and staff with tailored access to information. Sakthivel and Krishna (2022) emphasize the importance of student portals in centralizing services, making it easier for students to track their academic performance, timetables, and other essential activities. The findings of Iver et al. (2021) and Bergman (2019) further support the positive impact of portal usage on student performance and parental engagement.

By implementing a student portal, EMCOTECH can enhance communication, transparency, and access to essential resources for both students and parents, similar to successful models like J.H. Cerilles State College. The primary difference between the researcher’s student portal and that of J.H Cerilles State College lies in the inclusion of course enrollment feature within the researcher’s portal. This feature allows students to select and enroll available courses of their choosing, providing a more tailorable and flexible approach in their academic planning and development. The study aims to fill those gaps in digital services by providing an efficient, secure, and accessible online platform, that will improve overall engagement, and the academic experience at EMCOTECH.

**CHAPTER III**

**RESEARCH METHODOLOGY**

This chapter presents the research method, research environment, research procedure which comprises the seven (7) different phases such as conceptual, data gathering, analysis, system design, initial documentation, coding / testing, and the final documentation of the study.

**Research Methods**

There are several methods employed during the conduct of the study such as searching of an existing software application to evaluate the necessary features for the current study.

This study employs the Developmental Research, which can help address the multifaceted nature of the problem. It could bring qualitative insights which can help understand the experiences, needs, and pain points of the stakeholders. The other insights involved the identifying of the impact of the project conducted to the stakeholders involved. The gathered quantitative data will help highlights the system’s effectiveness.

**Research Locale**

This study is conducted at Eastern Mindanao College of Technology. Eastern Mindanao College of Technology is a private college in Pagadian which is widely known for its offering in TESDA programs such as CSS, Cookery and etc. The College Department offers mainly four programs; Bachelors of Science in Information Technology, Bachelors of Science in Social Work, Bachelors of Technical-Vocational in Teaching Education, Bachelor of Science in Criminology.

**Research Procedure**

In the event of an issue with the system, revert to Phase 2 for debugging and troubleshooting.

Phase 1: Conceptual

In this phase, the formulation of the research problem is conducted where a conceptualization of the problem is done. This is where the selection of the research design is made.

Phase 2: Data Gathering

Throughout this phase, the researchers conducted interviews to the stakeholders which involves the Students and Faculty of Eastern Mindanao College of Technology to gather information. Additionally, the researchers consulted with the research advisers for guidance on any overlooked aspects of the study.

Phase 3. Analysis

After gathering data, the researchers thoroughly analyzed the possible features that could be implemented in the School Portal using the information that they gathered during the initial documentation. The data gathered served as the basis for the formulation and development of the study.

Phase 4. System Designs

Putting the analysis’ findings to use. The researchers planned the technologies and approaches that would be used in the project’s development. Selecting frameworks, programming languages, databases, libraries, and software development tools that align with project’s objective and requirements is necessary. The researchers also considered security and a respectable user experience to ensure the project’s proper execution.

Phase 5. Coding / Testing

In this phase, the researchers started developing the system based on the planned system design and gathered data in Phase 2. The researchers utilized open-source frameworks and libraries to fasten developing a robust and efficient program. The frameworks and libraries used are Laravel as a backend framework and Inertia.js was utilized to bridge the gap between the backend framework and the front-end framework where we use React. Code and Functions are written to develop a series of commands which are designed to address the researchers’ problem, ensuring the system functions intended to achieve the desired outcome. The database used in the project is a relational database called MySQL.

Phase 6. Documentation

The researchers’ gathered the preliminary written information before developing study. It has three chapters: Chapter 1 contains *introduction*, *theoretical and conceptual framework*, *statement of the problem*, *objectives of the study*, *significance of the study*, *scope and limitation*, and *definition of terms.* Chapter 2 presents the *review of related literature and studies,* in which the researchers are able to spot three literatures and one study that are closely related to the study. Chapter 3 is the research methodology, which consists of: phases: conceptual, data gathering, analysis, system design, coding/testing, documentation, implementation, and final documentation.

Phase 7. Implementation

The fully developed web application will be tested manually or in actual setting to ensure it is robust and efficient. If the researchers found any bugs in a development environment before pushing to production. The researchers will revert to Analysis Phase (Phase 3) for another thorough evaluation and finalization of the program until the desired output are met. The researchers must review the system’s documentation and process back to Phase 1 to Phase 6 to determine whether the system is implementable or needs to be fixed. Once the system is efficient, free from bugs, and is robust, then it is final.

Phase 8. Final Documentation

To ensure the reliability and caliber of the final outcome of the study, the researchers applied a comprehensive review starting from Phrase 4. This review was necessary to find problems that was overlooked.

**Chapter IV**

**Systems Design and Analysis**

To fully understand the overview of the system, diagrams for the procedure in this project was introduced in this chapter.

**Overview of the System**

**“Eastern Mindanao College of Technology School Website Online Student and Faculty Portal”** will be a big help to the stakeholders of the school such as the students, and staffs with regards to the enrollment, course registration, viewing of grades. This system can solve the primary problem of students regarding course registration, enrollment, and viewing of grades which can be time-consuming when encountering rush hours. It has the capacity to allow the registrars, and the instructors to submit or post the grades of their students under their subject load so that they can view it online.

**System Requirements**

1. User Authentication:

* The system must allow students, faculty staffs, administrators, to login securely.
* Role-based access control must be implemented to ensure that users can only access features that are related to their role.

1. Course Registration

* Students must be able to view available courses or classes, register for classes, within the registration period.
* The Department Head or Dean should be able to manage course offerings, including adding new courses, updating course details, and viewing of enrolled students, to ensure eligibility.

1. Grade Viewing

* The system must allow students to view their grades for completed courses.
* Instructors or Teachers must be able to input and update student grades securely.

1. News Article & Thumbnails Publishing

* The system must allow relevant staffs to publish news or announcements to display in the site.

**System Design**

The system is designed using three-tier architecture, comprising the following layers;

1. Presentation Layer (Front-end):

* Developed using React.js to create a responsive and interactive user interface without full reload.
* Communicates with the back-end through resource controllers.
* User authentication is handled by Laravel Breeze, a package which manages user sessions, and authentication states.

1. Application Layer (Back-end):

* Built using Laravel, a PHP framework, to handle business logic, data processing, form requests.
* Laravel Breeze is used for managing user authentication, including login, registration, and password management.
* Controllers, models, resources are utilized to handle requests and interact with the database, ensuring data is processed correctly.

**Development Tools and Technologies**

**Programming Languages**

The following languages are utilized to develop this application;

* JavaScript: Used in front-end development, particularly in the React.js Framework
* PHP: Used for back-end development with Laravel framework.
* SQL: Used for database management and queries in MYSQL.

**Development Environment**

The following tools are utilized to develop this application;

* Integrated Development Environment (IDE): Visual Studio Code was the primary choice used for coding, debugging, and managing the project files powered by related VSCode extensions like PHP Intelephense,
* Local Development Server: XAMPP was used to setup a local development environment, including Apache for web server, MYSQL for the database, and PHP for the back-end.

**Frameworks and Libraries**

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