**Web-based Clearance System**

**with Violation Management using**

**QR Code in CHCC for BSCS4A**

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# Introduction

In many institutions, a person who is ready to leave an institution must go through a clearance procedure in order to find out if they will be allowed to leave or not. The person will receive a clearance if they are permitted to leave. [1].

Since technology has developed, many schools are enhancing their administrative functions by automating nearly all manual procedures, including the clearance system. The administration is assisted in the performance of public tasks. Improving internal procedures and practices, through institutional computerized systems and automation which promotes transparency and accountability [2]. To make sure that the student has no prior records of violations before graduating, student violations may also be included in clearance. Students who deliberately collaborate with others to violate university laws and/or regulations are subject to disciplinary punishment, according to the National University Student Code of Conduct. Students must however remove their violation records before graduating. [3].

QR codes are utilized for physical access control. According to Kao et al., He proposed a safe authentication system by combining QR codes and the One Time Password technique. QR codes are also used to share information between people who participate in the same social event or to share information in order to support the learning process [4]

The researcher conduct a study entitled Web based Automated Clearance Management System for CHCCi with QR Code. It is a web based system that can store and manage student violations and tuition balances. Using this system, they can reduce the usage of paper, improve the way of managing clearance, and preventing data loss.

## Project Context

Traditional Clearance forms are made accessible by academic institutions to students upon graduation, these must be signed in paper copy and brought to the various departments for approval, which when properly completed, indicate that the student has satisfied all criteria and is not owed to any of the departments or units that the student was affiliated with inside the university, the document must be delivered in a hard copy to the various offices. The students have to personally visit each office, making this method time-consuming.

In Concepcion Holy Cross College Inc., until now the process of managing clearance is still in the traditional way. Records of violation are kept only on paper, and there are instances that this record might be lost. According to Nwachukwu Prince Ololube, School records are of great importance to school guidance counselors as these records can provide counselors with a holistic picture of the students they counsel and disciplinary measures taken and can help counselors track student progress [5]. The students have struggled in terms of looking for the tuition balance of the students.

Using the Web-based Automated Clearance Management System with QR Code. The management of clearance will be automated, along with the management of violations, which results in paperless improvement. With this, the institute's information will be accurate and it helps to prevent the loss of data. This will be also beneficial to the students by using the QRcode they can now easily look into their balance by scanning through it.

## Purpose and Description

The purpose of this study is to develop a Web-based Automated Clearance Management System with QR Code in CHCCi for BSCS 4A. The researcher wants to develop it to improve the clearance system of Concepcion Holy Cross College Inc.

The Web based Automated Clearance Management System with QR Code is used to manage student violations including monitoring students remaining tuition fee balance. Monitoring student tuition balance will be easy with the help of a QRcode.

This system will be beneficial to:

**To the OSA.** This research can improve their clearance system, and manage violation records.

**To the guards.** This research helps them to improve their process of storing violation records.

**To the student.** This researchwill be also beneficial to them in terms of monitoring tuition balance as well as violations.

**To the researcher.** The researcher would acquire new knowledge, abilities, and research-planning techniques.

**To the future researcher.** This research will be beneficial to the future researchers. This could act as their guide while they are gathering data regarding Clearance management system.

## Objectives

The general objective of this research is to design and develop a clearance management system that will help the graduating students get their clearances quickly, this will also help students that are currently enrolled monitor their tuition fee balance and violations.

This research aims to achieve the following:

1. To design and develop a Web based Automated Clearance Management System with QR Code in CHCCi for BSCS4A associated with the following features:
   1. Admin
      1. View Students Violations
         1. Update Students Violations
      2. Create Student Info with QR Code
         1. Update Student Info with QR Code
      3. Deduct Student Tuition Fee Balance
   2. Guard
      1. Update Student Violations
   3. Student
      1. View Personal Violation
      2. View Tuition Fee Balance

## Scope and Delimitation

The aim of this study is to develop a computer software system that replaces the manual clearance methods for the students to easily monitor the violation of student records of the CHCCi.

The Web based Automated Clearance Management System with QR Code was exclusive for BSCS 4A only. Concepcion Holy Cross College will be the only institution affected; other colleges will not be included.

# RELATED LITERATURE

This Chapter presents the related information and previews other research work for the realization of this study. It aims to review the literature and studies related to the “Web-based Barangay Management System for Online Request and Transaction”.

## Functionality and Feature Matrix

**Table 1. Feature Matrix**

|  |  |  |  |
| --- | --- | --- | --- |
| **References** | **Description** | **Strength** | **Weakness** |
| Cadiz et al. (2017) [6] | The researchers developed an e-clearance system that automates and centralizes the clearance system. The system was designed to facilitate the fast processing of student clearance, to allow users to access the system online, and to save cost that the paper clearance entails. | The paperless clearance system eliminates those disadvantages of the  manual system. Hence, the e-clearance offers the academic constituents’ convenience in the processing of  student clearance. | It is not mobile responsive. Users can access it via mobile, but the user interface is difficult to understand. |
| Daud et al. (2022) [7] | The study describes the Secured CCSPC Web-Based Student Clearance System's use and predicted effects. This system includes two-factor authentication for students and designated offices. In the clearance system, a Secure Socket Layer (SSL) for data transit, as well as a software firewall and anti-SQL Injection attack, were offered and implemented. | No need for account creation as it relies on the CCSPC Portal to get an information by using a Web API | It is not mobile responsive. Users can access it via mobile, but the user interface is difficult to understand. |
| Jonathan et al. (2019) [8] | This study proposes a system that overcomes the issues with manual processing while improving on the identified automated ones. The study adopts a case study approach of a complete manual system for leading institutions of learning in Southwest Nigeria, with the existing procedure is carried out. The new system will reduce the amount of time and efforts wasted on students’ clearance as well as reduce cost incurred on paper by the institution. | The system encrypted the entire data. Which prevents hackers from accessing their important files. The only thing the hackers can see is jumbled nonsense (random characters, numbers, and symbols) that is meaningless to them. |  |
| Rochmawati et al. (2018) [9] | The researchers developed a system that creates a Laboratory Clearance Form. To create license from this application, the student needs to request license by accessing this web application and filling  request form with their registration number. If it is success, each sub head laboratory and head laboratory will receive notification from the system about student who request the license. If all of sub head laboratories confirm, the head of laboratory will receive notification. After the head of the laboratory confirms, the student then can download the Laboratory Clearance Form. | It has a unique way of validating the users, by using QR Code technology. | The Departments does not have an option to approve the student. And also, the student can’t monitor their clearance progress |
| Albert et al. (2019) [10] | The Researchers' main objective was to develop a reliable, effective, efficient and transparent Online Clearance System to eliminate the challenges stated. This system enables final year students monitor the progress / status of their clearance forms online as long as the technologies they are using can access the internet. | It covers a lot of functions, such as student module and administrator module. The student module can monitor their clearance progress. And in the administrator module, they can monitor the overall student’s clearance progress with a bar chart |  |
| Tunde at el. (2021) [11] | The purpose of system implementation is  to create a new system or modify an existing  system in compliance to stakeholder’s requirements. The student applies for clearance, an SMS notification is sent to the admin personnel in charge of clearing students in the department. | The system sends a notification to students who might have issues in the department. The system automatically fetches the student number and sends a SMS notification. The same format applies to other units | The system does not have a students information management. In case the student that applies for clearance made mistake, the system cannot revise it. |

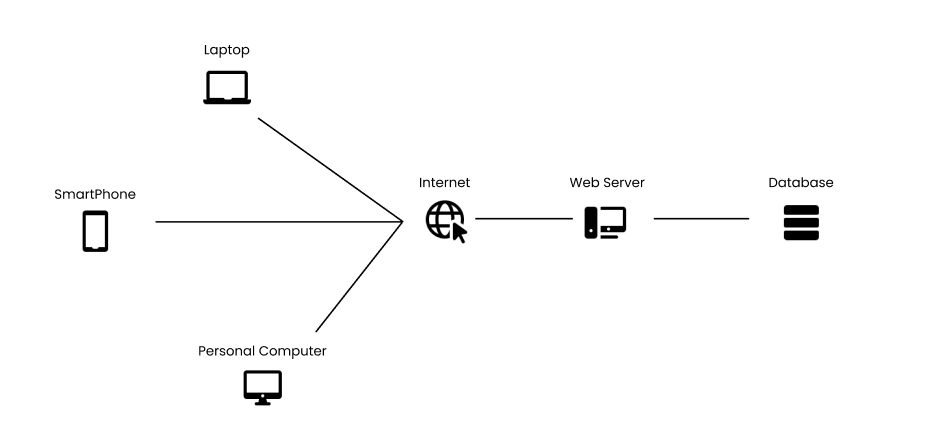
1. Student’s Information Management (e.g., add, delete, edit, save, search, and update database).
2. Violation Management
3. Log In System
4. User/Admin Module
5. Web Based
6. Mobile Responsive
7. Data Encryption
8. QR Code
9. Real-time

**Table 1. Feature Matrix**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Software | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Moving Towards Global Technological Advancement: Basis for the E-Clearance  Program Development | ✔ | ✖ | ✔ | ✔ | ✔ | ✖ | ✖ | ✖ | ✖ |
| Secured Cotabato City State Polytechnic College Web-Based Student Clearance System | ✔ | ✖ | ✖ | ✔ | ✔ | ✖ | ✔ | ✖ | ✖ |
| Development of Online Clearance System for an Educational Institution | ✔ | ✖ | ✔ | ✔ | ✔ | ✔ | ✔ | ✖ | ✔ |
| A Responsive Web-Based QR Code for Laboratory Clearance Form | ✔ | ✖ | ✔ | ✔ | ✔ | ✔ | ✖ | ✔ | ✖ |
| ONLINE CLEARANCE SYSTEM | ✔ | ✖ | ✔ | ✔ | ✔ | ✖ | ✖ | ✖ | ✖ |
| Design and Implementation of a Web-Based Sms-Notification Clearance System: A Case Study of Federal Polytechnic,Ile – Oluji, Ondo State. | ✖ | ✖ | ✔ | ✔ | ✔ | ✖ | ✖ | ✖ | ✖ |
| Real-time Web-based Clearance System with Violation Management using QR Code in CHCC for BSCS4A | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

## Conceptual Framework

**Network Architecture**



**2.1 Discussion of Model**

1. **Foreign Literature**

**[1]** [**https://iopscience.iop.org/article/10.1088/1742-6596/1108/1/012048/pdf**](https://iopscience.iop.org/article/10.1088/1742-6596/1108/1/012048/pdf)

**[2]https://books.google.com.ph/books?hl=en&lr=&id=Q3y5DwAAQBAJ&oi=fnd&pg=PA327&dq=clearance+system+web+based+in+school&ots=2W4w\_2d0VR&sig=1UMcnzVE6DZPRQXHqvPPc--1WCM&redir\_esc=y#v=onepage&q=clearance%20system%20web%20based%20in%20school&f=false**

1. **Local Literature**
2. **Foreign studies**

**[1]** [**file:///C:/Users/Admin/Downloads/cd015422-5963-409b-a4ae-5b693582ec6f-ONLINE%20CLEARANCE%20SYSTEM%20June%202019%20October%20(1).pdf**](file:///C:/Users/Admin/Downloads/cd015422-5963-409b-a4ae-5b693582ec6f-ONLINE%20CLEARANCE%20SYSTEM%20June%202019%20October%20(1).pdf)

**[2]** [**https://pub.abuad.edu.ng/Open\_Access\_Research\_Projects\_of\_Universities\_-\_Batch\_2/COMPUTER%20SCIENCE/DESIGN\_AND\_IMPLEMENTATION\_OF\_ONLINE\_CLEARANCE\_SYSTEM\_(A\_CASE\_STUDY\_OF\_CARITAS\_UNIVERSITY).pdf**](https://pub.abuad.edu.ng/Open_Access_Research_Projects_of_Universities_-_Batch_2/COMPUTER%20SCIENCE/DESIGN_AND_IMPLEMENTATION_OF_ONLINE_CLEARANCE_SYSTEM_(A_CASE_STUDY_OF_CARITAS_UNIVERSITY).pdf)

**[3] file:///C:/Users/Admin/Downloads/68e200db-320e-46b7-adfc-22edd1f4392f-Group%2011%20-%2026.1.2021.pdf**

1. **Local studies**

Table 1. Literature Matrix

Table 2. Functionality and Feature Matrix

**Conceptual Framework**

# TECHNICAL BACKGROUND

## Software Development Requirement

**Table 3. Software Requirements**

|  |  |
| --- | --- |
| **SOFTWARE** | **DESCRIPTION** |
| **Windows 10** | Operating System on the Developer's Computer or Laptop |
| **Visual Studio Code** | It is a text or code editor used for coding and modifying the system's programming codes. |
| **HTML** | The code that is used to organize and display a web page's content |
| **CSS** | It is used to design and layout web pages. |
| **JAVASCRIPT** | It is used to construct highly responsive interfaces, in order to enhance the user experience and provide dynamic functionality |
| **PHP** | A programming language that will be used for the system back-end. |
| **SQL** | Is a query language that is required in order for MySQL to work. |
| **MYSQL** | To store and retrieve information from the database |
| **XAMPP** | Is a local host or server that is used to test the website on computers and laptops before it is deployed to the main server. |
| **GIT** | Is a version control system to track changes from the system source code. |
| **GITHUB** | Hosting service that manages Git Repositories |
| **CHROME** | A browser to test and access the website |
| **POSTMAN** | Will be used to test APIs |
| **QR CODE API** | To implement the QR Code feature for the system |
| **FIGMA** | To design and layout the desired user-friendly interface (without code) |

Visual Studio Code will be used to create and debug the web-based application. The front-end stacks will be HTML, CSS, and JavaScript. PHP is used for the backend. The database for the program will be provided by the researcher using MySQL databases.

## Hardware Development

**Table 3. Software Requirements**

|  |  |
| --- | --- |
| **HARDWARE** | **SPECIFICATION** |
| **Personal Computer** | Operating System: Windows 10  Processor: AMD Ryzen 2600  GPU: Nvidia GT710  RAM: 8.00gb Memory |
| **Laptop** |  |
| **Smart Phone** | Operating System: Android  Processor: Octa-core (2.0GHz, 1.8GHz)  RAM: 4 GB  Storage: 64 GB  Display: 6.53 inches |
| **Printer** |  |

This section demonstrates the hardware and devices that will be used to create the Web-based Clearance System with Violation Management system. This is the suitable computer hardware for running the application, and this type of specification will also be compatible with application testing. The application is compatible with Windows 7 and later versions of the operating system.

## Sources of Data

The data was acquired by the researchers through the reading of research, literatures and studies about the clearance system, violation management, and QR Code. The researcher acquired ideas and knowledge through these literature and studies to help with the creation of new features and functionalities for Clearance System. Additionally, the researcher would use these references to improve the system's implementation and design.

# REFERENCES

References:

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[5] Nwachukwu P., “Excellent School Records Behaviour for Effective Management of Educational Systems” 2020.

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[11] Tunde, F. J., AjinajaMichealOlalekan, O., & Victor, J. O. Design and Implementation of a Web-Based Sms-Notification Clearance System: A Case Study of Federal Polytechnic, Ile–Oluji, Ondo State.

# APPENDICES

## Appendix A: Definition of Terms

**Query –**

**Front-end –**

**Back-end –**

**Git repositories -**

**API –**

**QR Code -**