

**DESIGNING A USER-FRIENDLY CRIME REPORTING WEB APPLICATION FOR  
UNIVERSITY OF BENIN, NIGERIA.**

**BY**

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**FEBRUARY 2025**

## **CERTIFICATION**

This is to certify that this project work was carried out by **REDEMPTION CHARLES IDEHEN** with Matriculation Number **PSC2008155** under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.sc) Degree in Computer Science of the University of Benin

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**APPROVAL**

This project work is hereby approved in partial fulfilment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

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**DATE**

## **DEDICATION**

This project is dedicated to God Almighty for giving me the strength and wisdom to see it through to completion, and even throughout my stay in the University of Benin (UNIBEN). It is also dedicated to my parents; Mr and Mrs Ikogwe and my brother Master Benedict Ikogwe; for their love, support and guidance throughout my academic journey.

## **ACKNOWLEDGEMENT**

This project work is hereby approved in partial fulfil My utmost acknowledgement goes to God Almighty for giving me the strength, wisdom and direction throughout my academic journey. I would like to express my gratitude to my project supervisor Dr. (Mrs) R.O. Osaseri, for her consistent guidance towards ensuring the successful completion of this project.

I would also like to specially thank my project coordinator Dr. (Mrs.) A.R. Usiobaifo, and other lecturers in the Department of Computer Science who I have been opportune to cross paths with, and have impacted me immensely these past few years: Prof. G.O. Ekuobase, Dr. F.O. Oliha, Prof. K.C. Ukaoha, Prof. A.A. Imiavan, Prof. (Mrs.) F. Egbokhare, Prof. (Mrs.) V.V.N. Akwukwuma, Prof. F.I. Amadin, Prof. (Mrs.) S. Konyeha, Prof. (Mrs.) V.I. Osubor, Dr. (Mrs.) Aziken, Dr. F.O. Chete, Dr. (Mrs) R.O. Osaseri, Dr. J.C. Obi, Mr. P. E.B. Imiefoh, Mr. I.E. Obasohan, Mr. S.O.P. Oliomogbe, Mr. K.O. Otokiti, Mr. I.E. obayagbonna, Mrs. R.I. Izevbizua, Mr. E.C. Igodan, Miss L.O.Usiosefe, Mr J. Okhuoya, Prof. F.A.U. Imouokhome, Mrs. J.I. Adun, Dr. E. Nweli and Mr. D.N. Idehen.

Finally, I would also like to thank my family and friends for their support, words of encouragement, and consistent guidance throughout this project.

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# CHAPTER ONE

## 1. INTRODUCTION

### 1.1 BACKGROUND OF STUDY

As society develops and human motives and relationships change, so does the mission to control crime and undermine law and order. A perfect society is governed by laws and rules that are all agreed upon and have quantifiable consequences for any member of the community found to have floated any specific legal infrastructure unit. Any society's legal framework is complemented by security tools that carry out the law in an effort to preserve law and order. The legal infrastructure is the phrase that describes how crucial it is for law enforcement officials to act or defend the shared interests of people in society. Additionally, it outlines the human rights and civil obligations of society's members.

It is believed that members of the public will notify the appropriate civil and military defense tools of any incidence involving a breakdown of the constitution and order. In order to arrive at a more accurate and rational judgment, reported issues are also thought to be carefully collected, examined, and observed. All of the evidence is gathered, safeguarded, and examined prior to the accused being charged in court and facing legal action. Without fear or favor, investigations are carried out. The legislation states that the due prevention procedure used during a criminal investigation is a crime in and of itself.

Recently, the reporting process and investigating crimes in society have been mainly manual. Those who have some complaints are going to work in departments of the security agents (e.g. Police, neighborhood corps) to communicate and write in statement problems that require their attention. At these departments, the security agents will raise an incident form and ask the reporter to fill some appropriate segments. The reporter will have to fill in some appropriate information in the incident form provided by the security agents of those departments. Some intelligent questions from reporters will be asked by the security agents and notes of that initial inquiry will also be made. Evidence suggested will be pointed out and more investigations will be conducted then new evidence will be collected, analyzed, and protected.

The technology has unlocked new opportunities of leveraging the various advantages of information technology to crime reporting. Many technology platforms have been invented to help agencies in reporting, responding to, and analyzing crime. The technical applications have been modified from the telegraph, special radio communication, and dedicated phone lines to the more responsive and more pervasive technical application platforms (such as web and mobile software applications). Nowadays mostly members of society have their own mobile devices that have easy access to the Internet. This benefit makes the web technique a more economical and open process to report a crime with coverage. Although many struggles have been made in this sector all around the world still In Nigeria there is not any established and responsive forum to report a crime. The limited platforms that are available in Nigeria (e.g. Amebo, Linda Ikeji) are blogs but these are also not ultimately fulfilling the purpose of appropriately reporting, analyzing, and investigating different crimes in Nigeria. A familiar thing to it is the respective platforms financed by Economic Financial Crime Commission (EFFC) and Investigation of Crime and Corrupt Practices (ICPC); they provide avenues to report crime incidents but investigation and acknowledgment are towards economical crimes. But this platform is not for Murder, battery, or harassment incidences that are generally reported at the regional Police station than financial crimes reported at EFFC and ICPC combined. These platforms are specialized in the area of financial crime and their activities are confidential so that procedures and progress of analyses can't be shared and communicated with other security agencies and the members of the community. The available platforms are far below how technology could be impeded to report crimes. These platforms are not sufficiently established and not very instinctive to use by city residents. The platforms are unidirectional because they do not have a response for the members of the nation. All these gaps have necessitated our interests for an ideal application that will address the limitations. We are going to develop an all-encompassing network that can report all modes of crimes, available to all members of the nation, suggestive (search for entities), interpretative, and informing. That platform will be providing a forum to several security agencies for sharing and gathering evidence and mobilizing members of the nation for particular interests that will dry better-policing crime deterrence and investigation.

## **1.2 STATEMENT OF PROBLEM**

Crime reporting is effective in Nigeria to a little extent because the manual system is used to file the records. However, manual systems have a lot of shortcomings. Some of the problems of crime reporting is lack of automation, inadequate personnel with the requisite knowledge to manage the automated system and a lack of a central database. The chief problem is the absence of single unified database. This problem is solely dependent on the crime report system where each individual now find it hard to reach special forces like the Police, Road safety and other special forces. To save the hassle of reaching special forces, students of University of Benin have access to a smartphone and the availability of these smartphones is where our crime report system comes to play. We tend to provide a very user-friendly interface for the students of University of Benin.

## **1.3 AIM OF THE STUDY**

The creation of a web application that is user-friendly and indicates incidents to report, evaluate, and investigate crimes in Nigeria should not be tedious if implemented correctly. We aim to suggest a robust system that will cater to report all sorts of crimes in University of Benin, Nigeria.

The aim of this project is to:

- Automate the process flow of the manual crime reporting system
- Map out relationships in the MongoDB database to make it easy to get useful information
- Implement create, read, update and delete (crud) operations on the database from the front end.
- Generate crime reports at the click of a button.

## **1.4 RESEARCH METHODOLOGY**

We will develop a web application that will provide a forum for reporting all kinds of crimes and also provide a platform for several security agencies and their agents to be registered to view and analyze various reported incidents. The public will also be eligible to report, get a response, and analyze the progress of reports without fear or pressure. That will be data-driven and the registered user experience will be responsive and constant. We will be able to access the applications on computers and other mobile devices through the Internet. No other hardware resources will be needed and the evaluation will be particularly experimental. Our scope is web application for University of Benin security to manage crime reporting.

## **1.5 MOTIVATION**

I grew up in an environment where armed robbery was rampant. I am passionate about contributing my knowledge and expertise to managing and reducing crime.

## **1.6 PROJECT OUTLINE**

Chapter one provides an introduction to crime reporting history in Nigeria. Chapter two highlights the literature review on success criteria for crime reporting platforms. The research methodology and other software artifacts for the proposed model are included in the third chapter. Chapter four is for the technical performances of the methods that have been outlined in chapter three and chapter five is the result and recommendation for future works.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 CRIME: AN OVERVIEW

The good and meaningful societies of the world frown at crime and any social vices that damage the collective security and the adoption of the values in the society. Crime has persisted as long as human society exists, thus the continuous effort and rightfulness for reporting, investigating, and providing evidence to charge someone who commits any criminal activity is being made. The word Crime is derived from the Latin word Crimen, dubbed charge of injustice, (Wiktionary contributors, 2025)

Crime is an act that brings violations and is punishable according to the law. Rape, cultism, kidnapping, murder, burglary, fraud, terrorism, robbery, cyber-crimes, bribery and corruption, money laundering, etc. are major crimes of Nigerian Universities in Edo, Lagos, Abuja, Delta, Kano, Plateau, Ondo, Oyo, Bauchi, Adamawa, Gombe etc. are at the top ten list of states with a high number of crimes According to the statistics published by the Nigerian National Bureau of Statistics in 2016, (Pelumi E Oguntunde, 2018). Crime is a fundamental issue to discuss because of the effects and punishments it attracts (which vary from fine to death).

The conclusion of what is awful or sane is determined through long and continual complicated interactions and reactions among members of the nation which has been considered a crime varies from person to person? There have been so many arguments that there cannot be a general theory to clarify Crime because of the diversity of human society and culture in the societies, More so, Gottfredson et.al (2010) had a distinct view, stating that the common characteristics in cultures can be identified and differences in cultures and societies is not an issue and a general theory can be developed to specify what should society adopt as a crime, that is crimes should not be isolated by criminologists but to check out the commonality in crimes pose a general law to defining Crime for all societies. The stamina of culture and unpredictability is unlikely to have a general set of rules for all human societies. No continent should be left out; (Ukoji 2016) reported that Africa is considered a flashpoint for high crime. He pointed out that the societies which have high records of violent crimes in recent times are giants of Africa like Nigeria and South Africa. America is listed as a high crime index nation while some areas in Europe are not able to maintain the crime index by a few digits.

The next important factor of the justice system is investigation and prosecution. The common awareness of what Crime constitutes is not enough without ultimately punishing the criminal to assist as a torrent and freeing the falsely charged individuals in such circumstances. The general justice system constitutes the laws; which specify the word Crime, the law apparatuses like security agencies, and processes that are developed to enforce justice. The community who are to be assisted by the justice system may begin to lose belief or effect in jungle justice for redressing their anger if the justice system which exists continues to fail with time. The criminal justice system also consists of a set of practices and institutions established by the government to ensure social control, prevent and mitigate crime, and impose criminal punishments on individuals who violate laws, while also incorporating rehabilitation and reintegration efforts.

Though, the vision of the criminal justice system is usually put in poor light in Nigeria because of the quick and declining systems of the justice system. Amnesty international has always rated Nigeria's justice system poorly and it is represented as a conduit for injustice from beginning to end. The actors in the justice system have also not helped the circumstance for starting acting as expected by the high roles they hold and the important role they play in the procedure of allocating justice. There is an opinion about legislators having granted interest thereby making inadequate legislation that does not interest the public. The judicial system is almost jeopardized as judges take bribes for perverting justice and the faith of the common person in society.

The method of the justice system defines if the people who are served will accept the result and continue to support the system or not. That's why the justice system is very important. An important element of the justice system is to make the system able to report cases, analyze and prosecute based on constitutions and get sentences. Recently, most societies report crime incidents on paper, which makes the procedure accessible to change, robbery, mutilation, and erasure of evidence that could have made the system apportion justice properly. Crime reporting has taken a new turn, and several cases can be reported unassisted and security agencies can easily record them and act quickly with the help of information technology. There are some national and individual-sponsored ICT platforms to report, investigate crime, and give feedback to the people. The outdated physical procedures fail to engage people as expected, leading to various concerns about how professionally and sincerely reported cases are analyzed. The United States of America has a common database to report crime incidents which have now developed policing in the US. The few electronic platforms to report crimes are isolated in Nigeria and have not been visited by the

Nigerians majorly because of the mistrust towards the procedure of justice, no response on reported cases. Etc.

Awareness of a comprehensive electronic platform should be increased to accommodate all crime incidents, ensure public accessibility, and provide timely responses. This will help maintain our legal infrastructure and justice system.

### **2.1.1 SOME EXISTING CRIME RECORD MANAGEMENT SYSTEMS IN THE DEVELOPED WORLD**

An information system (IS) is a system that converts data into helpful data. This consist of factors that interact to fulfill the purpose of giving data about day-to-day activities that control business operations tools that can be managed by managers (UC Berkeley Online Information Science Degrees, 2022). An information system involves elements such as hardware, software, faculty, databases, and techniques to achieve its goals.

A crime Information System (CIS) is a system that is used to maintain accounts of crimes or criminal cases which can also assist to get information about specific crimes. Statistical analysis of crime committed within a region-e.g. the South-Eastern region, Nigeria. Regional Information Sharing Systems (RISS) can be carried out by the usage of CIS– The RISS Program is a federally funded program overseen by the U.S. Department of Justice (DOJ), Bureau of Justice Assistance (BJA).

This crime information system supports law enforcement actions nationwide to fight illegal drug trafficking, individuality theft, human trafficking, severe crime, terrorist activity, and facilitate officer safety. In response to particular regional crime difficulties, the necessity for the association, and protected data sharing among law enforcement agencies, RISS was established more than 30 years ago.

Now, RISS is a national system of six multistate headquarters constructed to govern on a regional basis. RISS operates a protected internet, known as RISSNET, to simplify law enforcement communications and data sharing on a national basis, Information Sharing Environment (2012). The National Crime Information Center (NCIC) is a USA automated database of reported criminal justice data accessible to almost every law enforcement agency throughout the nation. It is a nationwide system controlled by the Federal Bureau of Investigation (FBI) dedicated to serve and support state, and national criminal justice agencies in their journey for upholding the law and protecting the public. The NCIC became active on January 27, 1967, to help law enforcement in

arresting criminals and locating stolen equity. This purpose has been expanded to accommodate locating lost individuals and further guarding law enforcement faculty and the public.

The NCIC database contains 18 files. Seven property files include reports for articles, boats, guns, license plates, securities, vehicles, and vehicle and boat parts. The 11 individual files are the Convicted Sexual Offender Registry, Foreign Fugitive, Identity Theft, Immigration Violator, Missing Person, Protection Order, Supervised Release, Unidentified Person, U.S. Secret Service Protective, Violent Gang and Terrorist Organization, and Wanted Person Files. Moreover, the database includes pictures that can be linked with NCIC reports to help agencies recognize people and equity entities.

The Interstate Identification Index, which includes automated criminal record data, is also attainable through the same system as the NCIC. Police Information Management System (PIMS) is an offline project that allows users to store police office's case components, Complaint Details, First Information Report (FIR) Details, etc.

This Software Package allows Police Departments to store all the components related to the department so that they can use them whenever needed. The project records several cases, FIR report, charge sheet report, Most Wanted Criminals record, payroll, attendance reports, and can upload and view criminal images and examined papers.

## **2.2 IMPORTANCE OF CRIME REPORTING IN UNIVERSITY**

Crime reporting in universities plays a critical role in ensuring the safety and well-being of students, staff, and faculty members. Universities are microcosms of society, and like any community, they are not immune to criminal activities. Over the years, the importance of crime reporting in higher education institutions has gained significant attention, especially with the rise of campus-related crimes such as theft, sexual harassment, cyberbullying, and even violent offenses. Effective crime reporting systems not only help in addressing these issues but also contribute to creating a secure and conducive environment for learning and personal development. One of the primary reasons crime reporting is essential in universities is that it fosters a culture of transparency and accountability. When students and staff feel confident that their reports will be taken seriously and handled appropriately, they are more likely to come forward with information about criminal activities. This transparency helps university administrations identify patterns of crime, allocate resources effectively, and implement preventive measures. For instance, a study

highlighted that universities with robust crime reporting mechanisms experienced a significant reduction in repeated offenses, as timely reporting allowed for swift intervention and resolution (H A Vidya, 2024).

Another critical aspect of crime reporting in universities is its role in protecting vulnerable populations. Students, particularly those in their first year, are often at a higher risk of becoming victims of crime due to their unfamiliarity with the campus environment and social dynamics. Sexual assault, for example, remains a pervasive issue on many campuses worldwide. According to a report by the Association of American Universities (2019), nearly 13% of students reported experiencing non-consensual sexual contact during their time in university. Effective crime reporting systems provide victims with a safe and confidential platform to seek help, ensuring that they receive the necessary support and that perpetrators are held accountable.

Moreover, crime reporting in universities contributes to the overall mental and emotional well-being of the campus community. When crimes go unreported, it creates an atmosphere of fear and mistrust, which can negatively impact students' academic performance and social interactions. On the other hand, a reliable reporting system reassures students that their safety is a priority, allowing them to focus on their studies and extracurricular activities. A study by McMahon et al. (2018) found that students who perceived their campus as safe were more likely to engage in positive social behaviors and achieve higher academic outcomes.

In recent years, the integration of technology into crime reporting systems has further enhanced their effectiveness. Many universities have adopted mobile apps and online platforms that allow students to report crimes anonymously and in real-time. These technological advancements have made it easier for victims and witnesses to come forward, especially in cases where they may fear retaliation or stigmatization. For example, the "LiveSafe" app, used by several universities in the United States, enables users to report incidents, share their location with campus security, and receive emergency alerts. Such tools have proven invaluable in improving response times and ensuring that no crime goes unnoticed.

Additionally, crime reporting in universities plays a vital role in shaping institutional policies and practices. Data collected from crime reports can inform decision-making processes, such as the allocation of security personnel, the implementation of safety training programs, and the development of awareness campaigns. For instance, after analyzing crime reports, a university might identify specific areas on campus that are prone to theft or vandalism and take steps to

increase surveillance or lighting in those areas. This proactive approach not only deters potential offenders but also demonstrates the institution's commitment to maintaining a safe environment. Finally, crime reporting in universities is essential for building trust between the campus community and law enforcement agencies. When students and staff see that their reports lead to tangible actions and outcomes, they are more likely to cooperate with authorities and participate in crime prevention initiatives. This collaboration is particularly important in addressing complex issues such as drug abuse, hazing, and hate crimes, which require a collective effort to resolve. In conclusion, crime reporting in universities is a cornerstone of campus safety and well-being. It promotes transparency, protects vulnerable populations, enhances mental health, leverages technology, informs policy decisions, and fosters trust within the community. As universities continue to evolve, so too must their approaches to crime reporting, ensuring that they remain responsive to the needs of their diverse and dynamic populations. By prioritizing effective crime reporting systems, universities can create an environment where students and staff feel safe, supported, and empowered to thrive.

## **2.3 METHOD OF CRIME REPORTING FROM PAST TO PRESENT ON CAMPUS**

Crime reporting on campuses has undergone significant changes over the years, reflecting advancements in technology, shifts in societal attitudes, and the evolving nature of crime itself. From traditional, manual methods to modern, digital platforms, the process of reporting crimes on campuses has become more efficient, accessible, and responsive to the needs of students, staff, and law enforcement. This section explores the stages of crime reporting methods on campuses, focusing on developments from 2015 to the present.

### **2.3.1 TRADITIONAL METHODS OF CRIME REPORTING (PRE-2015)**

In the past, crime reporting on campuses relied heavily on manual and face-to-face methods. Students and staff who witnessed or experienced a crime would typically report it to campus security offices or local police stations in person. Written reports were often required, detailing the nature of the crime, the individuals involved, and any evidence available. This process was time-consuming and sometimes intimidating, particularly for victims of sensitive crimes like sexual assault or harassment. Additionally, the lack of anonymity in these methods discouraged many from reporting crimes, leading to underreporting and a lack of accurate data on campus safety.

Another common method was the use of hotlines or emergency phones placed strategically across campuses. While these systems provided a direct line to campus security, they were limited in scope and often underutilized. The reliance on physical infrastructure meant that reporting was restricted to specific locations, making it inconvenient for those in remote areas of the campus. Furthermore, the absence of digital record-keeping made it difficult to track and analyze crime trends over time.

## **ADVANTAGES OF THE TRADITIONAL CRIME REPORTING SYSTEM**

### **1. PERSONAL INTERACTION AND TRUST BUILDING**

One of the key strengths of the traditional system is the face-to-face interaction between victims and law enforcement officers. This personal touch can help build trust and reassure victims that their concerns are being taken seriously. In many communities, especially in rural areas, this direct communication is valued because it allows victims to explain their situations in detail and receive immediate feedback. According to a study by (Alemika, 2013), personal interaction in traditional systems fosters a sense of accountability and transparency, as victims can physically see the steps being taken to address their complaints.

### **2. ACCESSIBILITY FOR NON-TECH-SAVVY POPULATIONS**

In regions with low digital literacy or limited access to technology, the traditional system remains the most accessible way to report crimes. For example, in many parts of Nigeria, older adults and rural residents may not be familiar with smartphones or internet-based platforms. The traditional system ensures that these individuals are not excluded from accessing justice. Over 60% of rural communities in Nigeria still rely on traditional methods for crime reporting due to a lack of technological infrastructure.

### **3. FORMAL DOCUMENTATION AND LEGAL VALIDITY**

Traditional crime reporting often involves written complaints or official forms, which create a formal record of the incident. This documentation is crucial for legal proceedings, as it provides tangible evidence that can be used in court. In many cases, the physical presence of a victim at a police station ensures that their complaint is officially logged, reducing the risk of it being ignored

or overlooked. A study emphasizes that traditional reporting methods are often perceived as more credible and legally binding compared to informal or digital alternatives, (Okafor, 2016).

## **DISADVANTAGES OF THE TRADITIONAL CRIME REPORTING SYSTEM**

### **1. BUREAUCRATIC DELAYS AND INEFFICIENCY**

One of the most significant drawbacks of the traditional system is its bureaucratic nature. Victims often face long waiting times at police stations, and the process of filing a report can be time-consuming and cumbersome. In some cases, victims may need to visit multiple times before their complaints are officially recorded. This inefficiency can discourage people from reporting crimes, especially minor offenses.

### **2. FEAR OF VICTIMIZATION AND LACK OF ANONYMITY**

The traditional system requires victims to identify themselves and provide personal details, which can deter individuals from reporting crimes, particularly in cases involving sensitive issues like domestic violence or corruption. Fear of retaliation or stigmatization is a significant concern, especially in close-knit communities. Lack of anonymity in traditional systems is a major reason why many crimes, especially gender-based violence, go unreported. (Kommey, 2023)

### **3. LIMITED REACH AND ACCESSIBILITY**

While the traditional system is accessible to non-tech-savvy populations, it is often inaccessible to those living in remote or underserved areas. In many cases, police stations are located far from rural communities, making it difficult for residents to report crimes. Additionally, the cost of transportation and the time required to travel to a police station can be prohibitive

### **4. CORRUPTION AND LACK OF TRUST IN LAW ENFORCEMENT**

In many countries, including Nigeria, corruption within law enforcement agencies is a major issue. Victims may be asked to pay bribes to have their complaints taken seriously, or their cases may be deliberately ignored. This lack of trust in the system discourages many people from reporting crimes.

### **2.3.2 TRANSITION TO DIGITAL PLATFORMS (2015–2018)**

The mid-2010s marked a significant shift in crime reporting methods, driven by the widespread adoption of smartphones and internet connectivity. Campuses began to integrate digital platforms into their reporting systems, allowing students and staff to report crimes online or through mobile apps. These platforms offered several advantages over traditional methods, including greater accessibility, faster response times, and the ability to report crimes anonymously.

For example, many universities introduced online reporting forms on their official websites, enabling users to submit detailed information about incidents without visiting a security office. Mobile apps like LiveSafe and Rave Guardian gained popularity during this period, offering features such as real-time reporting, GPS tracking, and direct communication with campus security. These tools not only simplified the reporting process but also empowered victims to seek help more confidently.

However, the transition to digital platforms was not without challenges. Some students and staff were hesitant to adopt these new methods due to concerns about data privacy and the effectiveness of digital reporting. Additionally, the digital divide—where not all students had access to smartphones or reliable internet—limited the reach of these platforms. Despite these issues, the move toward digital reporting represented a significant step forward in improving campus safety.



**Figure 1 – Logo of the LiveSave app**

### **2.3.2 MODERN CRIME REPORTING SYSTEMS (2019–PRESENT)**

From 2019 onward, crime reporting on campuses has become increasingly sophisticated, leveraging advanced technologies to enhance efficiency and user experience. Many universities now use integrated systems that combine online reporting, mobile apps, and social media platforms

to create a seamless reporting process. These systems often include features like AI-powered chatbots, which guide users through the reporting process and provide immediate support.

One notable development is the use of anonymous reporting tools, which allow students to report crimes without revealing their identity. This has been particularly effective in addressing sensitive issues like sexual assault, where victims may fear retaliation or stigma. Platforms like Callisto, introduced on several U.S. campuses, enable survivors to document their experiences securely and connect with resources when they are ready.

Another trend is the integration of crime reporting systems with campus-wide safety initiatives. For instance, some universities have implemented smart surveillance systems that use cameras and sensors to detect suspicious activities and alert security personnel in real time. These systems are often paired with mobile apps that allow users to report crimes directly from their devices, creating a more proactive approach to campus safety.

The COVID-19 pandemic further accelerated the adoption of digital reporting methods. With many campuses transitioning to remote or hybrid learning, traditional reporting methods became impractical. Universities responded by enhancing their online platforms and promoting digital tools to ensure that students could report crimes regardless of their location. This shift highlighted the importance of flexibility and adaptability in modern crime reporting systems.

## **2.4 BENEFITS OF DIGITAL CRIME REPORTING SYSTEMS**

Digital crime reporting systems offer numerous advantages for both the public and law enforcement agencies. One of the most significant benefits is improved accessibility. People can report crimes from the comfort of their homes or on the go, eliminating the need to visit a police station. This is particularly useful in rural or underserved areas where police stations may be far away. Another key benefit is faster response times. Digital systems allow law enforcement to receive and process reports in real-time, enabling quicker action. For instance, a study by Johnson et al. (2020) found that digital reporting systems reduced the average response time by 30% in urban areas. Additionally, these systems often include features like geolocation, which helps police pinpoint the exact location of a crime, improving their ability to respond effectively. Digital crime reporting systems also promote transparency and accountability. By providing a digital trail of reports, these systems make it easier to track how law enforcement agencies handle cases. This

can help build trust between the public and the police, which is crucial for effective crime prevention.

## **2.5 CHALLENGES OF DIGITAL CRIME REPORTING SYSTEMS**

Despite their benefits, digital crime reporting systems face several challenges. One major issue is digital literacy. Not everyone is comfortable using technology, especially older adults or those in rural areas with limited access to the internet. This can create a barrier to adoption and limit the effectiveness of these systems.

Another challenge is privacy and security concerns. Users may worry about their personal information being exposed or misused. The potential for backlash against individuals who report crimes online is a significant concern that could deter people from using these platforms, (Oghogho et.al, 2024)

False reporting is another problem. Some individuals may misuse digital platforms to submit fake reports, either as a prank or to harass others. This can waste law enforcement resources and undermine the credibility of the system. To combat this, many platforms now include verification mechanisms, such as requiring users to provide contact information or evidence.

## **2.6 IMPACT ON SOCIETY**

Digital crime reporting systems have had a profound impact on society. They empower citizens to take an active role in crime prevention and community safety. For example, platforms like Nextdoor allow neighbors to share information about suspicious activities, creating a sense of collective responsibility.

These systems also help law enforcement agencies allocate resources more effectively. By analyzing data from digital reports, police can identify crime hotspots and trends, enabling them to deploy officers more strategically. A study by (Kale, 2024) found that The system is designed to manage cases effectively, allowing law enforcement agencies to monitor complaints and track the progress of investigations.

Moreover, digital crime reporting systems have proven particularly valuable in addressing underreported crimes, such as domestic violence and cyberbullying. Victims who may feel uncomfortable reporting crimes in person can use these platforms to seek help anonymously.

## **2.7 FUTURE OF DIGITAL CRIME REPORTING SYSTEMS**

The future of digital crime reporting systems looks promising, with advancements in technology set to enhance their capabilities. Artificial intelligence (AI) and machine learning can be used to analyze crime data and predict future incidents, enabling proactive policing. Blockchain technology could improve data security and transparency, addressing privacy concerns.

Public-private partnerships will also play a crucial role in the development and implementation of these systems. Collaboration between governments, tech companies, and non-governmental organizations can help overcome challenges like digital literacy and infrastructure limitations.

## **2.8 WHY IS A CRIME REPORTING SYSTEM IMPORTANT FOR STUDENTS?**

Crime reporting systems are essential tools in modern society, and their importance extends to students in various ways. Students, as active members of their communities, are often vulnerable to crime and can benefit significantly from the existence of efficient crime reporting mechanisms. These systems not only help in ensuring their safety but also empower them to contribute to a safer environment. Below, we explore the importance of crime reporting systems for students, supported by recent research and evidence.

### **2.8.1 ENSURING PERSONAL SAFETY**

One of the most immediate benefits of crime reporting systems for students is the enhancement of personal safety. Students, especially those in higher education institutions, often face risks such as theft, assault, harassment, and cyberbullying. A reliable crime reporting system allows students to report incidents quickly and anonymously, ensuring that appropriate action is taken to address the issue.

For example, in a study conducted by (Fox, 2013), it was found that college campuses with accessible crime reporting systems experienced a significant reduction in violent crimes. The study highlighted that students who felt confident in reporting crimes were more likely to seek help, leading to faster responses from law enforcement and campus security.

### **2.8.2 BUILDING TRUST IN AUTHORITIES**

Many students, particularly in regions like Nigeria, often hesitate to report crimes due to a lack of trust in law enforcement agencies. A well-designed crime reporting system can bridge this gap by providing a transparent and user-friendly platform for reporting. When students see that their reports lead to tangible outcomes, their trust in authorities' increases.

### **2.8.3 PROMOTING A CULTURE OF ACCOUNTABILITY**

Crime reporting systems encourage students to take responsibility for their safety and the safety of others. By reporting crimes, students contribute to a culture of accountability, where wrongdoing is not tolerated. This is particularly important in educational institutions, where peer pressure and fear of retaliation can often discourage students from speaking up.

### **2.8.4 ADDRESSING CYBERCRIME AND ONLINE HARASSMENT**

In the digital age, students are increasingly vulnerable to cybercrime and online harassment. Social media platforms, online classrooms, and digital communication tools have become breeding grounds for cyberbullying, identity theft, and other forms of online abuse. A crime reporting system that includes provisions for reporting cybercrime is crucial for protecting students in the virtual space.

A research paper by (Smith et.al 2020) highlighted the growing prevalence of cybercrime among students and the need for specialized reporting mechanisms. The study found that students who had access to cybercrime reporting tools were more likely to report incidents, leading to quicker resolutions and reduced psychological trauma.

### **2.8.5 ENHANCING MENTAL HEALTH AND WELL-BEING**

Experiencing or witnessing a crime can have a profound impact on a student's mental health. Fear, anxiety, and stress are common consequences of crime, and these can negatively affect academic performance and overall well-being. A crime reporting system provides students with a sense of security, knowing that they have a platform to seek help and justice.

A study by (Roberts, 2019) found that students who used crime reporting systems to report incidents of harassment or assault experienced lower levels of anxiety and depression compared

to those who did not report. The study emphasized the psychological benefits of having a reliable reporting mechanism in place.

### **2.8.6 ENCOURAGING CIVIC ENGAGEMENT**

Crime reporting systems also play a role in fostering civic engagement among students. By participating in crime prevention and reporting, students learn the importance of contributing to the safety and well-being of their communities. This sense of civic responsibility can extend beyond their academic years, shaping them into active and responsible citizens.

A blog post by the ((NIJ, 2021)) highlighted that students who engage with crime reporting systems are more likely to participate in other community safety initiatives, such as neighborhood watch programs and public awareness campaigns.

### **2.8.7 SUPPORTING MARGINALIZED GROUPS**

Students from marginalized groups, such as women, minorities, and LGBTQ+ individuals, are often at a higher risk of experiencing crime. A crime reporting system that is inclusive and sensitive to the needs of these groups can provide them with a safe space to report incidents and seek support.

For example, a study by (Patel, 2022) found that female students were more likely to report incidents of harassment and assault when the reporting system allowed for anonymity and provided access to counseling services. This highlights the importance of designing crime reporting systems that cater to the unique needs of vulnerable populations.

### **2.8.8 PREPARING STUDENTS FOR THE FUTURE**

In a world where technology is increasingly integrated into daily life, familiarity with crime reporting systems can prepare students for future challenges. By using these systems, students develop digital literacy skills and learn how to navigate online platforms responsibly. This knowledge is invaluable in a world where cybercrime and digital security are growing concerns.

A research paper by (Lee, 2021) emphasized the role of crime reporting systems in educating students about digital safety and responsible online behavior. The study found that students who

used these systems were more aware of cybersecurity risks and better equipped to protect themselves online.

Crime reporting systems are vital for students as they ensure personal safety, build trust in authorities, promote accountability, and address modern challenges like cybercrime. These systems also support mental health, encourage civic engagement, and protect marginalized groups. By providing students with a reliable platform to report crimes, we empower them to contribute to a safer and more just society. As technology continues to evolve, it is essential to design crime reporting systems that are accessible, inclusive, and effective in meeting the unique needs of students.

## 2.9 RELATED WORKS

1. Campus Crime Reporting Software Framework Using Short Message Services (SMS)
2. Development of a Software System for Realtime Management of Crime Reports in Southwestern Nigeria: The Administrative Approach
3. Digital Criminal Biometric Archives (DICA) and Public Facial Recognition System (FRS) for Nigerian criminal investigation using HAAR cascades classifier technique
4. Enhancing security in Nigeria: the implications of social media-based crime reporting
5. Developing an Interoperable Crime Management System
6. Automated complaint and report management system for tertiary institutions

**Table 1.0 Summary Table of Related Works**

AUTHOR(S)	YEAR	OBJECTIVES	RESULTS
Jimoh, A. O., Ibrahim, M., Adeniran, R., Olawale, T., Yusuf, A., & Folorunso, M.	<b>2023</b>	The research aims to develop a software framework for campus crime reporting that utilizes short message services (SMS) to enable students to report crimes efficiently using their mobile phones. This framework is designed to facilitate timely communication between students and the security agents of the institution.	The system verifies three types of The developed software framework successfully captures essential details of the crime, including the type of crime, the location where it occurred, and the date/time, all reported by the student in SMS format.

			information: geolocation, registered mobile device, and subject class hour.
Akinyede, J., Ponnle, A. A., Olebu, C. G., Akinluyi, F. O., Thompson, A. F., Dahunsi, O. A., Alese, B. K., & Oyinloye, M. A.	2023	The primary objective of the research is to develop a comprehensive management platform, named Geotiscm, that effectively manages crime reports and activities in Southwestern Nigeria, addressing the challenges posed by inadequate management systems and enhancing the synergy between various security architectures.	The developed crime management system received high performance ratings from beta testing, with the User Interface rated at 96%, Functionality at 94%, Clarity of functionality at 92%, and Maintainability at 91%. This indicates that the system performs satisfactorily and effectively serves its intended purpose.
Ndubuisi, O. J., Adene, G., Sunday, B. T., Mbonu, C. E., & Gift-Adene, A. U.	2024	The primary objective of the research is to develop an automatic criminal investigation system that can identify criminals based on facial recognition, utilizing a constantly updated digital library to aid in investigations and enhance the identification process of offenders in Nigeria.	The DICA-FRS system demonstrated the capability to effectively replace human systems in criminal investigations by successfully recovering faces from significant distances and displaying the name of the offender on the output screen of the DICA web application.
Oghogho, M. Y., Osazuwa, O. M. C., Iyamba, O. D., Ekeng-Ekeng, H., & John, I. G.	2024	The study aims to examine how social media platforms facilitate community mobilization and real-time information sharing in the context of crime reporting, utilizing frameworks such as Information Diffusion Theory (IDT) and Social Network Theory (SNT).	The study emphasizes the importance of adopting a well-rounded strategy to utilize the capabilities of social media for reporting crimes, while also acknowledging the difficulties it presents, such as misinformation and privacy issues.
Ajayi, B. A., Nweke, J. E. C., & Ogah, M. U.	2022	The primary objective of the research is to enhance interagency collaboration in combating crime in Nigeria through the development of a computerized	The Interagency Crime Management System (ICMS) enhances interagency collaboration among different security agencies in

		system known as the Interagency Crime Management System (ICMS), which facilitates data sharing among different security agencies under the Federal Government of Nigeria.	Nigeria by providing a standardized web-based application that accepts data in a uniform format, facilitating better communication and data sharing regarding crime management.
Nwosu, P. C., Benson-Emenike, M. E., Ifeanyi-Reuben, N. J., & Chukwu, E. G.	2023	To develop a web-based Automated Complaint and Report Management System that utilizes Information and Communications Technology (ICT) to improve the management of complaints and reports in tertiary institutions, specifically addressing the lack of digitalization in Nigerian universities.	The developed Automated Complaint and Report Management System demonstrated to be a better, easier, faster, reliable, and more secure method for handling complaints and reports in tertiary institutions, leading to fair and prompt responses.

## **CHAPTER THREE**

### **3.0 SYSTEM ANALYSIS AND DESIGN**

This chapter provides a model of the development process while offering an overview of the system design and system analysis.

#### **3.1 SYSTEM ANALYSIS**

System analysis is an important step in software development where we carefully study an existing system or the requirements for a new one. This involves understanding, documenting, and defining the system's features, parts, processes, and how they work together. This helps in creating effective solutions.

System analysis and design involve a structured approach to understanding and improving a system. For this project, the following methods were used:

1. **Requirement Gathering:** This involved collecting information from students, staff, and security personnel at the University of Benin to understand their needs and challenges with the current crime reporting process. Interviews, surveys, and observations were conducted to gather data.
2. **Feasibility Study:** A feasibility study was carried out to determine whether the proposed system is practical and achievable. This included assessing technical, economic, and operational feasibility.
3. **Structured Analysis:** This method breaks down the system into smaller, manageable components to understand how they interact. It helps in identifying the inputs, processes, and outputs of the system.
4. **Prototyping:** A prototype of the web application was developed to demonstrate its functionality and gather feedback from users. This iterative process ensured that the final design meets user requirements.

#### **3.2 ANALYSIS OF EXISTING SYSTEM**

The current crime reporting system at the University of Benin relies heavily on traditional methods, such as physical visits to security offices or phone calls to emergency hotlines. These methods are outdated and inefficient, often leading to delays in reporting and responding to crimes. For instance, students and staff must physically go to the security office to file a report, which can be

time-consuming and inconvenient, especially during emergencies. Additionally, the lack of a centralized platform means that crime data is often scattered and difficult to track, making it challenging for security personnel to analyze trends or respond promptly. The manual nature of the system also increases the risk of errors in documentation, further complicating the process of addressing reported incidents.

Another significant issue with the existing system is the lack of anonymity, which discourages many students and staff from reporting crimes. Fear of victimization or retaliation is a major concern, particularly in cases involving harassment or theft. Without a secure and anonymous reporting mechanism, many incidents go unreported, leaving victims without support and allowing perpetrators to continue their activities unchecked. Furthermore, the system is not accessible to off-campus students, who face unique security challenges but have no convenient way to report crimes. These limitations highlight the urgent need for a more modern, efficient, and user-friendly solution to improve crime reporting and enhance campus safety.

### **3.3 PROBLEM OF EXISTING SYSTEM**

The existing crime reporting system at the University of Benin has several problems, including:

1. **Slow Response Times:** Manual processes and lack of a centralized system lead to delays in responding to crime reports.
2. **Low Reporting Rates:** Fear of victimization and lack of anonymity discourage students and staff from reporting crimes.
3. **Poor Data Management:** Crime data is often stored in physical files, making it difficult to analyze and retrieve information.
4. **Limited User Engagement:** The current system does not engage users effectively, leading to low participation in crime prevention efforts.

### **3.4 OVERVIEW OF PROPOSED SYSTEM**

The proposed system is a web-based crime reporting application designed to address the limitations of the existing system. Key features of the proposed system include:

1. **User-Friendly Interface:** The application will have a simple and intuitive interface to ensure ease of use for students, staff, and security personnel.

2. Anonymous Reporting: Users will have the option to report crimes anonymously to encourage participation.
3. Real-Time Notifications: Security personnel will receive real-time notifications of reported crimes, enabling faster response times.
4. Centralized Database: All crime reports will be stored in a centralized database for easy access and analysis.
5. Accessibility: The application will be accessible from any device with an internet connection, ensuring that off-campus students can also report crimes.



### **3.5 SYSTEM DESIGN**

- 1.** The system design involves creating a blueprint for the proposed application. This includes:
- 2.** Functional Requirements: The system must allow users to report crimes, track the status of their reports, and receive updates. Security personnel must be able to view and manage reports.
- 3.** Non-Functional Requirements: The system must be secure, reliable, and scalable to accommodate future growth.
- 4.** Database Design: A relational database will be used to store crime reports, user information, and other data. Tables will be designed to ensure efficient data retrieval and storage.
- 5.** Security Measures: The system will include features such as user authentication, data encryption, and access control to protect sensitive information.

### **3.6 SYSTEM DESIGN TOOLS**

System design tools are essential for creating detailed plans, diagrams, and specifications for software systems. These tools help developers and designers visualize the structure, components, and interactions of a system, making it easier to understand and implement. They are especially useful for breaking down complex systems into smaller, manageable parts. Below are some of the most commonly used system design tools:

#### **1. Unified Modeling Language (UML)**

Unified Modeling Language (UML) is a widely used tool for designing and visualizing software systems. It provides a standard way to create diagrams that represent the structure and behavior of a system. UML is not tied to any specific programming language or development method, making it versatile and adaptable. It is particularly useful for designing object-oriented systems, where the focus is on objects and their interactions.

UML includes various types of diagrams, such as use case diagrams, class diagrams, sequence diagrams, and activity diagrams. These diagrams help developers and stakeholders understand how the system will work, how different components will interact, and how data will flow through the system. For example, in the crime reporting web

application for the University of Benin, UML can be used to create a use case diagram that shows how students, staff, and security personnel will interact with the system.

## **2. Data Flow Diagram (DFD)**

A Data Flow Diagram (DFD) is a tool used to show how data moves through a system. It illustrates where data comes from, how it is processed, and where it goes. DFDs are especially useful for understanding the flow of information in a system and identifying potential bottlenecks or inefficiencies.

A DFD typically includes four main components:

- a. **External Entities:** These are sources or destinations of data outside the system, such as users or other systems.
- b. **Processes:** These are actions or functions that transform data, such as submitting a crime report or updating a database.
- c. **Data Stores:** These are places where data is stored, such as databases or files.
- d. **Data Flows:** These are the paths that data takes as it moves through the system.
- e. For the crime reporting application, a DFD can be used to show how crime reports are submitted by users, processed by the system, and stored in a database for security personnel to access.

## **3. System Flowchart**

A system flowchart is a visual representation of how a system operates. It uses symbols and arrows to show the flow of data and the sequence of operations in a system. Flowcharts are easier to understand than written descriptions, making them a valuable tool for communicating system design to stakeholders.

System flowcharts are particularly useful for showing high-level processes, such as how a crime report is submitted, processed, and resolved. They can also highlight decision points, such as whether a report requires immediate attention or can be handled later. For example, in the proposed crime reporting system, a flowchart can illustrate the steps involved in

submitting a report, from the user filling out a form to the security team receiving a notification.

#### **4. Entity-Relationship Diagram (ERD)**

An Entity-Relationship Diagram (ERD) is a tool used to model the relationships between different entities in a system. An entity can be a person, place, thing, event, or concept that is relevant to the system. ERDs are commonly used in database design to show how data is organized and related.

There are four main types of relationships in an ERD:

- a. One-to-One: A single entity is related to only one other entity. For example, one driver drives one car.
- b. One-to-Many: A single entity is related to multiple entities. For example, one teacher teaches many students.
- c. Many-to-Many: Multiple entities are related to multiple entities. For example, many readers read many books.
- d. Many-to-One: Multiple entities are related to a single entity. For example, many students attend one school.

#### **5. Wireframing Tools**

Wireframing tools are used to create visual representations of the user interface (UI) of a system. These tools allow designers to sketch out the layout of screens, buttons, forms, and other UI elements before the actual development begins. Wireframes are like blueprints for the application, helping developers and stakeholders visualize how the system will look and function.

Popular wireframing tools include Figma, Adobe XD, and Sketch. For the crime reporting web application, wireframes can be used to design the layout of the homepage, crime report submission form, and dashboard for security personnel. This ensures that the application is user-friendly and meets the needs of its users.

#### **6. Prototyping Tools**

Prototyping tools are used to create interactive models of a system. These models, or prototypes, allow users to test the functionality of the system before it is fully developed. Prototyping is an iterative process, meaning that feedback from users is used to refine and improve the design.

Tools like InVision and Axure RP are commonly used for prototyping. For the crime reporting application, a prototype can be created to simulate the process of submitting a crime report, receiving a confirmation, and tracking the status of the report. This helps identify any usability issues early in the design process.

## **7. Database Design Tools**

Database design tools are used to create and manage the database that will store the system's data. These tools help developers define the structure of the database, including tables, fields, and relationships. They also provide features for testing and optimizing the database.

Popular database design tools include MongoDB. For the crime reporting application, these tool can be used to design a database that stores user information, crime reports, and security personnel details. The database must be designed to ensure efficient data retrieval and storage.

## **8. Version Control Tools**

Version control tools are used to manage changes to the system's code and design files. These tools allow multiple developers to work on the same project without overwriting each other's work. They also provide a history of changes, making it easy to revert to a previous version if needed.

Git and GitHub are widely used version control tools. For the crime reporting application, these tools can be used to track changes to the codebase, collaborate with team members, and ensure that the system is developed in a structured and organized manner.

### **3.7 SYSTEM DESIGN TOOL: UML**

Unified Modeling Language (UML) will be used to model the system and visualize its components. UML diagrams provide a clear and standardized way to represent the system's structure and behavior.

### **3.8 UML – USE CASE DIAGRAM**

A use case diagram is a type of UML diagram that shows the interactions between users and the system. For the proposed crime reporting application, the use case diagram includes the following actors and use cases:

## CHAPTER FOUR

### SYSTEM IMPLEMENTATION

#### 4.1 Software Implementation Tools

This project focuses on only the front end implementation of an online QR based attendance system; the following software tools were used:

1. **Implementation Languages:** The following are the various programming languages used for the project's implementation:
  - a. **Hyper Text Markup Language (HTML):** This is the markup language used in creating the content, building structure and defining the semantic of the web page.
  - b. **Cascading Style Sheet (CSS):** This language was used to define the visual representation and styling of the HTML elements in the web page. It was used to control the layout, colors, fonts, spacing, and overall design of a webpage.
  - c. **JavaScript:** This is a scripting language that is primarily used for adding interactivity and dynamic behavior to websites and web applications. It was to create interactive user interfaces, handle user input, manipulate data, and perform various actions on a web page without requiring a page reload.
2. **Implementation Framework:** Frameworks are pre-built groups of code and tools that serve as the basis for creating applications in software development. By providing reusable elements, patterns, and conventions, they give an organized approach to development. The frameworks used during this project are:
  - a. **ReactJs:** This is a JavaScript front-end framework focused on building dynamic and interactive user interfaces for web applications. It excelled in creating component-based architectures, managing UI state, handling user interactions, and efficiently updating the DOM.
  - b. **Tailwind CSS:** This is a CSS framework focused on simplifying the process of styling web applications by providing a collection of utility classes that cover a wide range of design aspects. It was particularly useful for rapidly creating responsive designs and maintaining consistent styling across an application.

- 3. Implementation Platforms:** Visual Studio Code (VS Code) is a widely popular, free, and open-source code Integrated Development Environment developed by Microsoft. It is an excellent choice for building web applications, regardless of the operating system you are using and integration to Version Control System like Git and Github which was the remote Version Control System.
- 4. Deployment Platforms:** For making the web application available to all users, it was deployed using vercel. Vercel is a cloud platform designed to facilitate the deployment and hosting of web applications and websites. It specializes in providing a seamless experience for developers to deploy projects, particularly those built using modern frameworks like ReactJs.
- 5. Operating System:** This project is a full web application that was built using the Windows operating system, a very user friendly and developer-friendly system.

#### **4.2 User Documentation – System Testing**

System testing is a vital stage in the software development life cycle that entails thorough testing of a software application or system as a whole. System testing tries to make sure that all parts and modules of the program function properly as an integrated system and adhere to the requirements.

The following was tested:

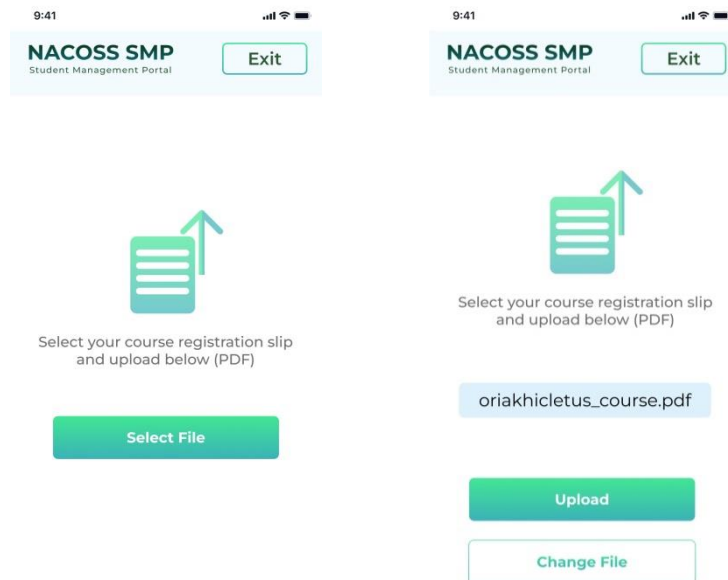
1. The login and logout functionality for the student.
2. The login and logout functionality for the admin (lecturers)
3. Are students able to upload their course registration slip in pdf format only?
4. Are the students able to view their profile?
5. Are students able to get their QR code slip after upload?
6. Is the super admin able to add and remove other admins?
7. Are the admins able to see the details of students that have uploaded their course registration slip for each level?
8. Are the admins able to scan the student's QR slip during the day of the slated examination?
9. Are the admins able to view the exam attendance details for each course?
10. Are the admins able to download the attendance list for the different courses?

### 4.3 Screenshots of the Running System



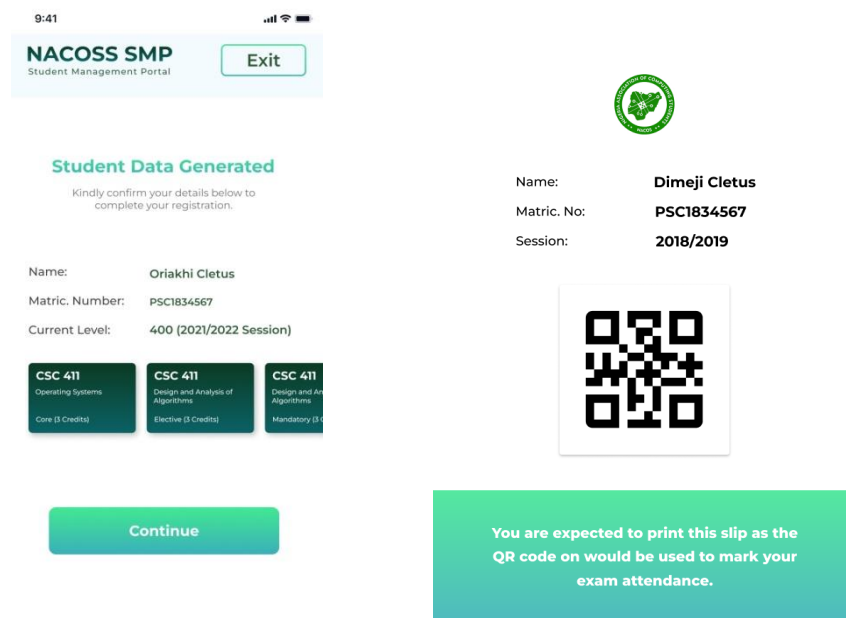
**Figure 4.1 Admin and Student's Login Page**

Figure 4.1 shows the login page of NACOSS SMP for the admins and students; the admins login with their “**email address**” and “**password**” while the students login with their “**email address**” (preferably their university email) and their “**matriculation numbers**”.



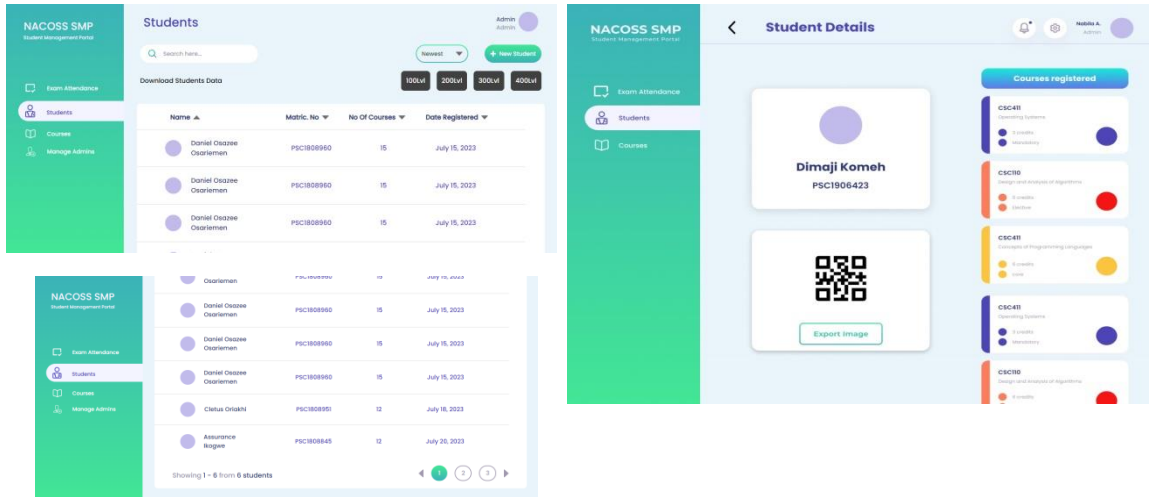
**Figure 4.2 NACOSS SMP Student’s Upload Page**

Figure 4.2 shows the upload page, where the students have to upload their course registration slip in **.pdf** format as downloaded from their **student's kofa page**.



**Figure 4.3 NACOSS SMP Student's Profile Page and QR Code Slip**

As soon as the student uploads his or her course registration slip, a slip contain his or her unique QR code is sent via the email he or she provided while logging in, Figure 4.3 above shows this and the student's profile page which includes all the student details i.e. Student's Name, Student's Matriculation Number, Student's Current Level and the Student's Registered Courses as drawn from the uploaded course registration slip.



**Figure 4.4 NACOSS SMP Admin's Dashboard**

In Figure 4.4 above, the snapshot on the left shows the details of students that have uploaded their course registration slip and this data can be downloaded for each level; the details are gotten from the slip, it includes student's name, matriculation number, number of courses, date of course registration. Clicking on a student leads the admin to another page, the snapshot on the right of Figure 4.4; this shows the student's name and matriculation number on one card, the student's QR code on the other card, and the courses registered cards on the right side of the page.

**NACOSS SMP**  
Student Management Portal

**Exam Attendance**

Nabila A.  
Admin

Search here...

+ Take Attendance

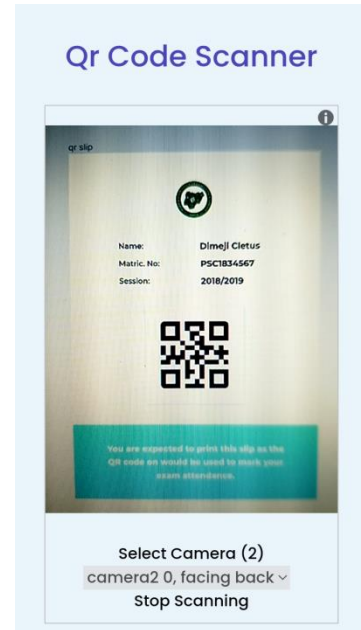
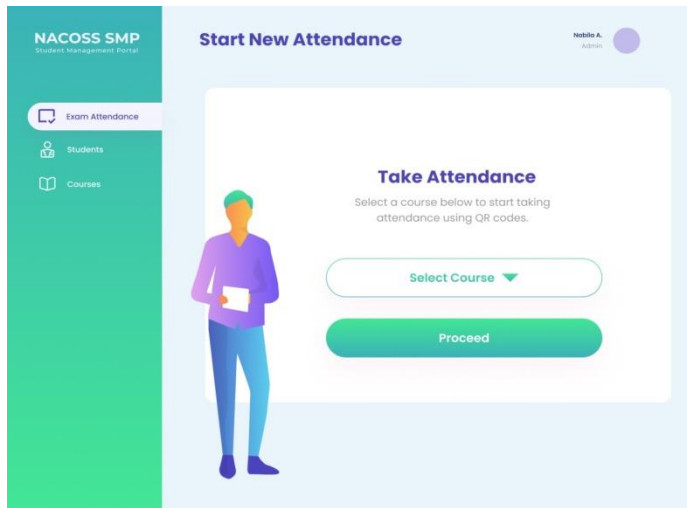
Course Code ▼	Course Title ▲	Students Present ▲	Students Registered ▲	
CSC411	Design And Analysis Of Algorithms	250	255	⋮
CSC411	Stochastic And Computations	250	255	⋮
CSC411	Design And Analysis Of Algorithms	250	255	⋮
CSC411	Design And Analysis Of Algorithms	250	255	⋮
CSC411	Design And Analysis Of Algorithms	250	255	⋮
CSC411	Design And Analysis Of Algorithms	250	255	⋮

Showing 1-6 from 1000 courses

◀ 1 2 3 ▶

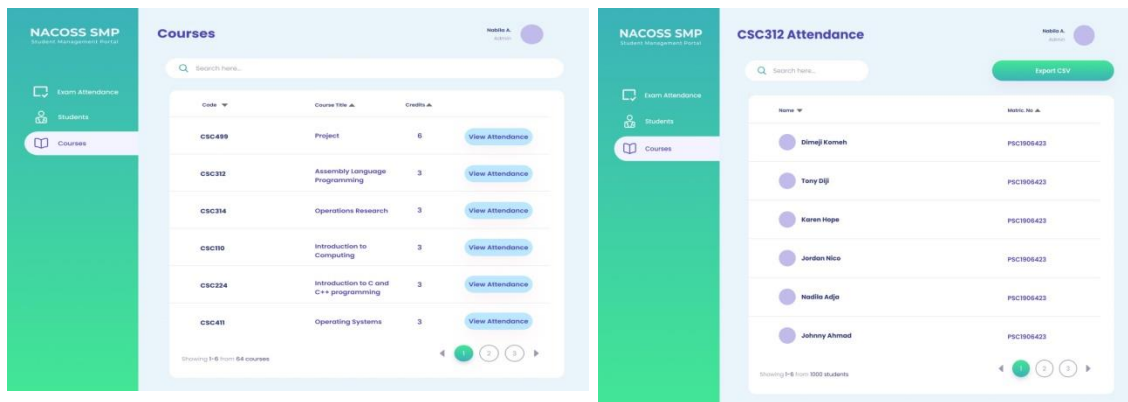
**Figure 4.5 Exam Attendance Page**

Figure 4.5 shows each course to be done per semester, including the number of students registered for the course, as well as the number of students present for the examination which is derived from the number of students QR slip scanned during the day of the slated examination. Clicking on a course takes the admin to the take attendance page shown in Figure 4.6 below.



**Figure 4.6 Take Attendance Page and the QR Code Scanner**

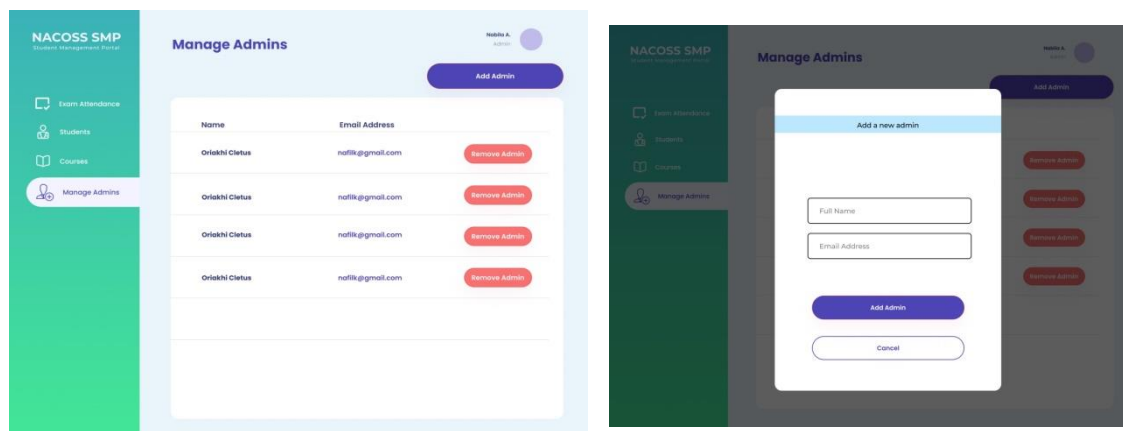
The admins can take attendance for a particular course on the take attendance page which is shown on the snapshot on the left in Figure 4.6. The snapshot on the right shows the QR code scanner which scans the QR code on a student’s QR code slip and then records the attendance of the student for that particular course.



**Figure 4.7 Courses Page**

The attendance data is a csv file, to download it the admin has to navigate to the courses page on the admin dashboard which is shown in the left snapshot in Figure 4.7, it contains the course code,

title, credit and a button to view attendance for a particular course. On click of the “View Attendance” button, the user is directed to another page that contains the attendance data for that course which includes the names and matriculation number of every student present for the examination whose QR code slip was scanned. The page also contains an “Export CSV” button that downloads the attendance data for each course.



**Figure 4.8 Manage Admins Page (View, Add, and Delete admins)**

NACOSS SMP makes room for only one admin which is known as the super admin, which is the Head of Department (HOD); this super admin can in turn add other lecturer (course advisers for each level) as admins, Figure 4.8 provides the pages for adding and removing admins.

#### **4.4 System Usability Evaluation**

The System Usability Scale (SUS) is a widely used questionnaire-based tool for assessing the usability and user-friendliness of software, websites, and digital systems. John Brooke invented it in the 1980s, and it has since become a popular tool for analysing user experiences. The SUS consists of a series of questions that users must answer to offer a quantitative measure of usability that may be used to compare different systems or track development over time.

The SUS is especially useful for gaining insights about users' perceptions of a system's general usability. It covers both subjective and objective aspects of usability, providing vital feedback to designers and developers on how well a system corresponds with user expectations and needs.

The SUS questionnaire comprises ten statements, and participants respond to each statement using a 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree." The scale includes options:

1. Strongly Disagree.
2. Disagree.
3. Neutral.
4. Agree.
5. Strongly Agree.

The SUS is scored by converting the replies into numerical values and then applying a formula to calculate the final usability score. The possible values range from 0 to 100, with higher scores suggesting improved usefulness. A SUS score of 70 or more is considered above average, while a score of 85 or higher indicates great usability.

The SUS score can provide vital insight into how well an Online Attendance and Student Management System project is meeting user needs and expectations. The SUS questionnaire can be used to collect feedback on the system's usability, user-friendliness, and overall experience from peers who are trying the system. This feedback can assist to uncover strengths and weaknesses in the system's design and functionality, allowing for changes to the user experience and the creation of a platform that is more closely aligned with the needs of its users.

SUS Score	Grade	Adjective Rating
> 80.3	A	Excellent
68 – 80.3	B	Good
68	C	Okay
51 – 68	D	Poor
< 51	F	Awful

**Source:** <https://uiuxtrend.com/measuring-system-usability-scale-sus/>

The usability test questionnaire was created using the following clear and concise questions. The system was then tested with ten users and feedback was gathered using this questionnaire.

1. I found the system to be easy to use.
2. I needed to learn a lot of things before I could get going with the system.
3. The various functions in the system are well integrated.
4. I would imagine that most people would learn to use this system very quickly.
5. I found the system very intuitive to use.
6. I needed to rely heavily on technical support to use the system.
7. The system has too many inconsistencies.
8. I felt very confident using the system.
9. I needed to learn a lot of things before I could accomplish tasks.
10. Overall, I am satisfied with the system's usability.

**Table 4.1 User's Usability Scores Table**

<b>User</b>	<b>SUS Score</b>
User 1	52.5
User 2	90.0
User 3	77.0
User 4	47.5
User 5	65.0
User 6	92.5
User 7	85.0
User 8	72.5
User 9	50.5
User 10	82.5
<b>Total</b>	<b>715</b>

Based on the table above, the total usability score is 715. The average score which is gotten by dividing the total score by the number of users (10 users) is 71.5. According to the SUS Grade and Rating Table in Fig 4.10 above, the average usability score of the system falls at the 68 - 80.3 mark, therefore the system can be classified as good to use.