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IMPROVING JUDICIAL ADMINISTRATION: AN ELECTRONIC COURT CASE MANAGEMENT SYSTEM APPROACH

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ABSTRACT

Recently, the need for efficient case management and the prompt delivery of justice has become increasingly evident as a catalyst to improve the integrity, reliability, and confidence in the Nigerian judicial sector. While many court cases are currently been managed manually in many developing and underdeveloped countries, the need for an electronic court case management system remains very important to facilitate fast administration of judicial functions. To this end, this paper presents an electronic court case management system, with key functionalities such as case registration, case management, payment, and witness information management. These components were designed and integrated using object-oriented and analysis design methodology. In addition, use case modeling was applied to demonstrate the user object interaction of each major system component, before it was implemented as a software application using MySQL and Java programming language. The result was validated experimentally and the deduction showcased the effectiveness of the new system in managing cases.

Keywords: Case Management, Court, Judiciary, Case Registration, Plaintiff, MySQL

1. INTRODUCTION

The judiciary is the branch of government responsible for interpreting and applying the law in disputes between individuals, organizations, or government entities (Muhammad, 2019). It has the power to determine the constitutionality of laws and to make decisions that have the force of law. The judiciary has many types of courts, including the Supreme Court, customary court, high court, and appeal courts. The Supreme Court is the apex of all courts whose judgment is final; the High Court is the highest level of court proceeding over civil and criminal matters; the appeal court reviews decisions made by lower courts such as the customary and high courts, while the customary court is established to practice based on tradition and custom of a particular environment, with jurisdiction over civil matters such as disputes over land, inheritance, marriage, among others (Bright, 2018).

In Nigeria for instance, Udosen (2020), posited that the Customary Court (CC) regulates about 80% of the overall cases, making it the busiest among all the courts. However, the unavailability of resources, coupled with human factors such as bias in the selection of cases and corruption, as submitted by Aboniki (2021), have made the CC static in the administration of its functions and hence, access to justice difficult for the common man. According to Chinua-Achebe (2019), if we remain comfortable and become inattentive to this problem, we run the risk of committing further grave injustice. Increasingly today, technology has been identified as a facilitator of access to justice, especially in speeding up the management process of court cases. According to Grepon (2020), there is a need for a system that can improve court services like filing, registration of cases, indexing, monitoring of cases, etc., and hence presents the need for an Electronic Court Case Management System (ECMS). Therefore this paper presents an ECMS, to improve case management and the administration of judicial functions in Nigeria. The organization of this paper is as follows;

i. An overview of an electronic court case management system will be presented
ii. The model of the electronic court case management system will be presented
iii. Implementation of the models presented and then experimental validation of the implemented results discussed.

2. Electronic Court Case Management System (ECMS)

An Electronic Court Case Management (ECM) system is a software solution that allows courts to manage their cases electronically, from initial filing to final disposition. Such a system provides a centralized repository of case information that can be accessed by judges, clerks, and other authorized court personnel. They are designed to automate and streamline court processes, reduce paperwork, and improve efficiency (Owoeye, 2021; Nwabueze and Ozioko, 2021). The benefits of such systems include faster case processing times, reduced errors, improved access to information, and increased transparency. One of the key features of ECM systems is electronic filing, which allows litigants to file their cases and associated documents electronically. This not only saves time but also reduces the need for paper-based processes. An important feature of ECM systems is case tracking (Grepon, 2020). This allows authorized personnel to track the progress of a case from start to finish, ensuring that cases are processed efficiently and that deadlines are met. ECM systems also typically include tools for case scheduling, document management, and electronic communication (Grönlund, 2021; Olaniyan, 2021). For example, magistrates can use the system to schedule hearings and send electronic notifications to parties involved in a case (Akinsuyi, 2021). Documents related to a case can be stored electronically and accessed by authorized personnel from anywhere with an internet connection (Soyele, 2021). Overall, electronic court case management systems are an important tool for modernizing court operations, improving access to justice, and increasing efficiency (Mumuni, 2020). They are used by courts of all sizes and can be customized to meet the specific needs of individual jurisdictions.

3. The Case Management System Design

Court case management system was developed using four major components which are the case manager, case registration, and witness information and payment sections respectively as presented in the figure 1;

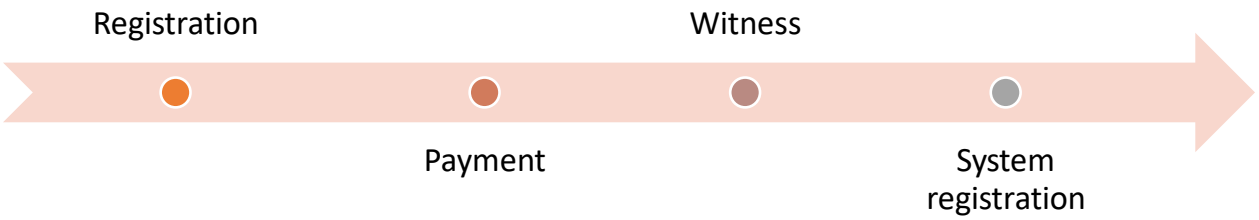

Figure 1: Component of the court case management system

Figure 1 was used to present the relationship between the case management system designs, showing the various components which made up the management system.

1. **Case Manager**

The case manager serves as the foundational framework for navigating the intricacies of legal matters. Its role begins with the filing of a case, allowing for the initiation of legal proceedings through the submission of case files and information that facilitates online management of the cases. Once the case is filed, the registration process, which captures detailed information about the cases, is initiated, and then other features such as searching for cases and sorting of cases are all applied in the case management section.

2. **Case Registration**

The case registration was pivotal in establishing a structured foundation for legal proceedings. This section applies unique identities to cases and records vital information such as parties involved, case type, expected duration, and expected hearing date. In addition, this section records the progression of cases.

3. **Witness Information**

The management of witness information is a critical aspect of court case proceedings and was also considered in this case management design. The witness section incorporated features where the witness profile is captured and information such as testimonies is recorded. This information is securely stored and is presented to facilitate a case hearing and proceeding.

4. **Payment**

Financial aspects play a significant role in court case management, and an effective payment system is integral to maintaining transparency and compliance. Fee tracking allows for the recording of various fees associated with the case, including filing fees and legal representation charges. This feature ensures that financial transactions are accurately recorded and provides real-time visibility into fee balances. Payment verification mechanisms add an additional layer of reliability, confirming the accuracy of payments made and generating receipts for transparency. The case management system revealed the four major components, which are the case manager, registration platform, witness information platform, and payment platform. This system

introduced diverse features to case management, as summarized in Figure 2, which shows the main features and functionality of each component.

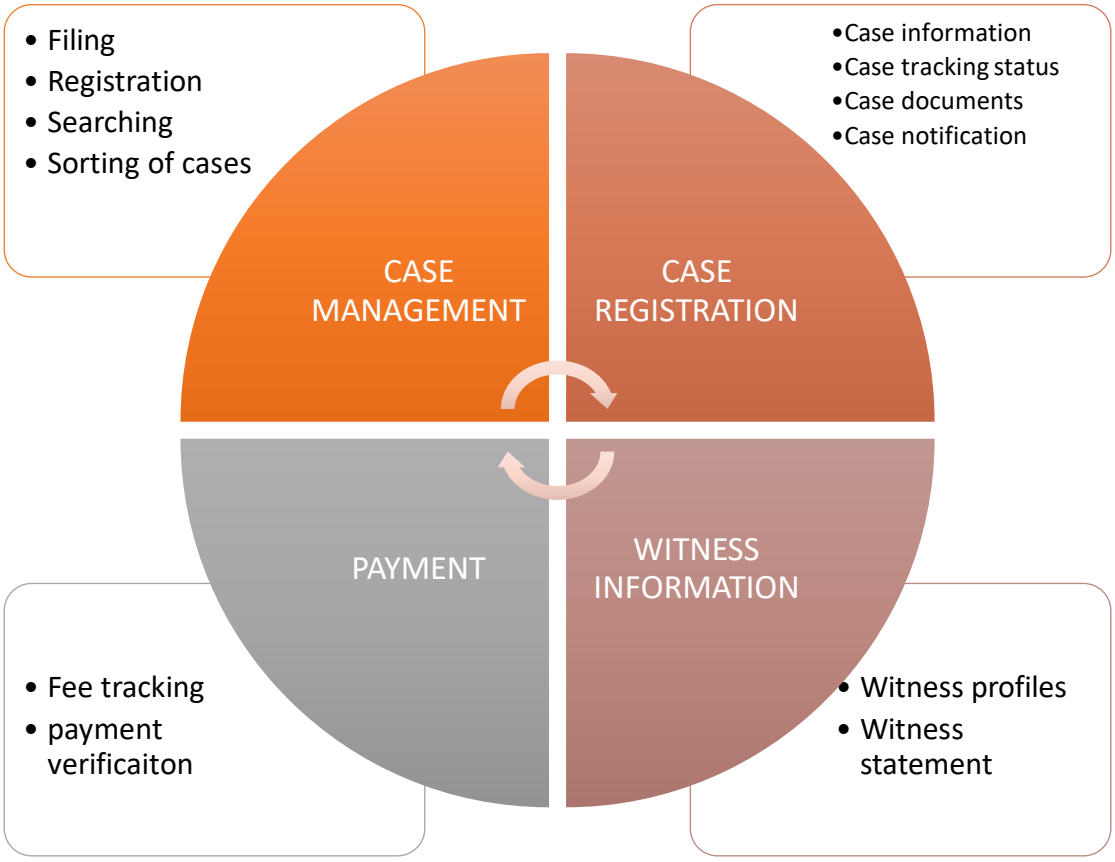

Figure 2: Component of the court case management system with their features

Figure 2 presents the case management system integrated with basic features such as the filling of cases, registration of new cases, searching of cases, and sorting of cases. In the registration component, the features include recording case information, tracking the status of cases, and overall case documentation. The witness information component of the system collects and manages information provided by the witness relating to a particular case, as well as the profiling of the witness, while the payment section tracks fees made for the registration of cases and also payment verification of receipts.

4. DATABASE DESIGN

Database design is concerned with how data is represented and stored within the case management system. The data tables are the case manager, payment system, witness system, and case registration platform. The system stores the data on the MySQL database server, which is an open-source tool required for the modeling of the electronic court case management system. The data tables are presented in the tables as follows:

Table 1: Case manager

Data attributes	Description	Data type
Case ID	Case serial number	Integer

Case number	Case unique number	String
Case type	Civil or criminal	String
Date	Date of submission	Date
Status	Closes or in progress	String
Case Document ID	Serial number of documents	Integer
Document type	Pleading or evidence	String
File format	Pdf, doc, excel, csv formats	Float
Upload date	Date of document upload	Date and time

Table 2: Payment System

Data attributes	**Description**	**Data type**
Fee ID	Fee serial number	Integer
Case ID	Case unique number	String
Fee type	Filing or legal fee	String
Date	Date of submission	Date
Amount	Amount paid for case registration	Integer
Payment status	Paid, pending	Binary
Payment method	Case, credit card	String
Receipt upload format	Pdf, doc, excel, csv formats	Float
Receipt submission dates	Date of receipt upload	Date and time

Table 3: Witness table

Data attributes	**Description**	**Data type**
Witness ID	Unique witness ID	Integer
Statement ID	Serial number of the statement	String
Case ID	Case serial number	String
Witness full name	Full name of the witness	String
Contact number	Phone number of the witness	Integer
Recording date	Date of the recording	Date and time
Recording format	Test, audio format	String
State of origin	The witness state of origin	Float
Address	The witness address	String

Table 4 Registration table

Data attributes	**Description**	**Data type**
Registration ID	The case registration serial number	Integer
Case ID	Case unique number	String
Filer names and date	Name of the admin, Date of case registration	String; date and time
Email address	The email of the plaintiff	String
Upload date	Date of case document submission	Integer
Case type	Civil or criminal	Binary
Payment status	Paid or pending	String
File type	Pdf, doc, excel, csv formats	Float

Expected Hearing Date	Expected case duration	Date and time

Table 1–4 presents the attributes for each of the system segments, considering the data type that will be collected from the case plaintiff, the data description, and the variables. These were used for the database design of the case management system.

4.1 Prototype design for the court case management system interface

The CCMS interface prototype was developed through the implementation of the storyboard approach, a method that entails crafting a document using hand-drawn sketches to visually represent a prototype of the screen layout and navigation across various screens. This technique aims to guarantee a user-friendly experience by providing a tangible and intuitive preview of the interface design and user interaction flow.

4.2 Input Design For Court Case Management System

The input design for the Court Case Management System (CCMS) is a fundamental component that focuses on gathering and processing data efficiently to support the system's overall functionality. This involves creating user interfaces that allow legal professionals to input case-related information seamlessly. The design incorporates intuitive forms and data entry screens, ensuring that users can easily enter and update details such as case numbers, parties involved, legal documents, and key dates. Validation checks are implemented to enhance data accuracy and completeness, minimizing errors in the system. Furthermore, the input design considers the diverse nature of legal information, accommodating various document formats and case types. Overall, the input design for CCMS aims to provide a user-friendly, flexible, and secure mechanism for legal professionals to input and manage the wealth of information associated with court cases.

4.3 Output Design for the Court Case Management System (CCMS)

The output design for the system is a crucial aspect aimed at facilitating efficient and user-friendly information presentation within the legal context. In developing this system, careful consideration is given to the formatting, organization, and accessibility of outputs generated by the CCMS. The design emphasizes clarity in displaying case-related information, including court schedules, case statuses, and legal documents. User interfaces are crafted to be intuitive for legal professionals, ensuring ease of navigation and retrieval of pertinent data. Additionally, the output design incorporates security measures to safeguard sensitive information while maintaining the confidentiality and integrity of court records. Overall, the output design for CCMS is tailored to enhance the effectiveness of legal processes, promote transparency, and streamline information access for all stakeholders involved in the judicial system.

5. Use Case and Domain Analysis of the New System

Use Case Universal Modeling Languages are deployed in this paper to explain in details the main components of the requirement definition. They describe the activity through which the system will satisfy the aforesaid functional requirements. The Use Cases would then be deployed in constructing the process model which explains the operations (user action) in a more formal manner. The process uses diagrams to document an object-based decomposition of systems showing the interaction between these objects and the dynamics of these objects. The researcher aim here is to provide a common vocabulary of object-based terms and diagramming techniques

that is rich enough to model any system development project from analysis to design. For the design the use case diagram, the actor is the court admin, while the supporting actors are the defendant, and plaintiffs respectively. The use case here model interactions such as case registration, payment management, witness information, case management with the scheduling and tracking algorithms. The use case for the registration is presented in figure 3;

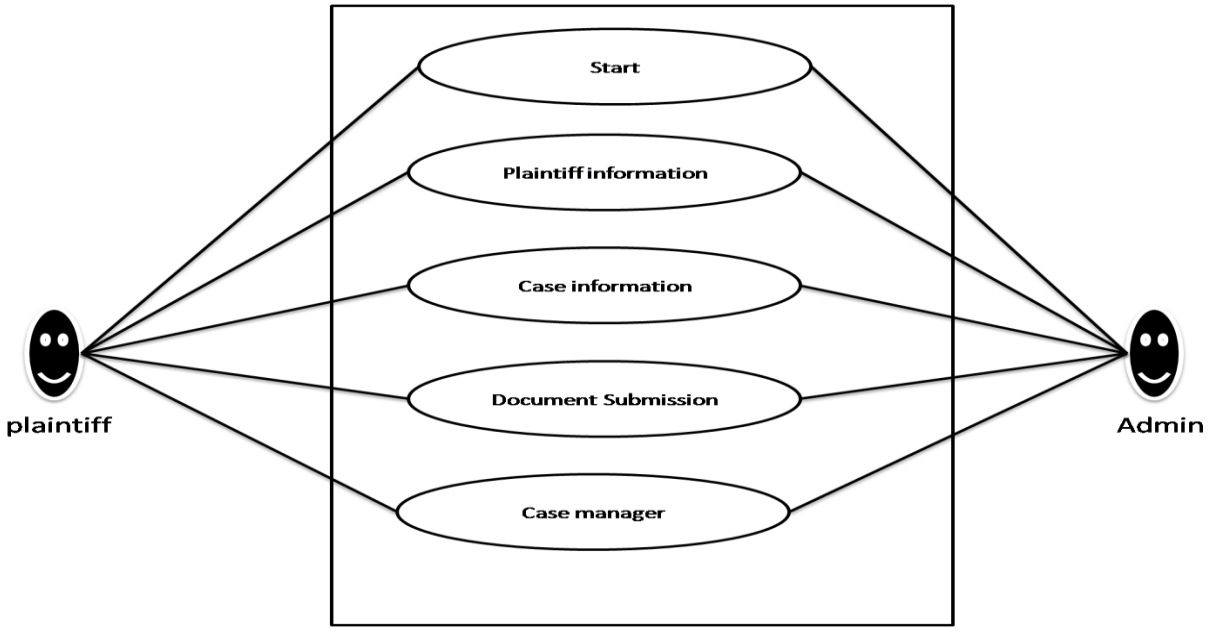

Figure 3: The Use case of the registration process

Actor: plaintiff

Supporting actor: court case admin

Brief description: The plaintiff provided necessary information need to register the case. The information include profile details, case information such as the case types and description, the documents to prove the case is submitted and managed by the case manager which is a central database management system for the case management.

Pre-conditions: it was assumed that the plaintiff already have every information needed to register the case.

Post-conditions: after the registration process, the case is scheduled and processed for hearing

Main flow of events:

1. Start
2. Plaintiff information
3. Case information
4. Document submission
5. Case manager

The next figure 4 presents the use case of the payment information system which is responsible for the management of fee made to facilitate the case processes. The actors are the plaintiff while the supporting actor is the court administrator, which takes and digitally record the informations.

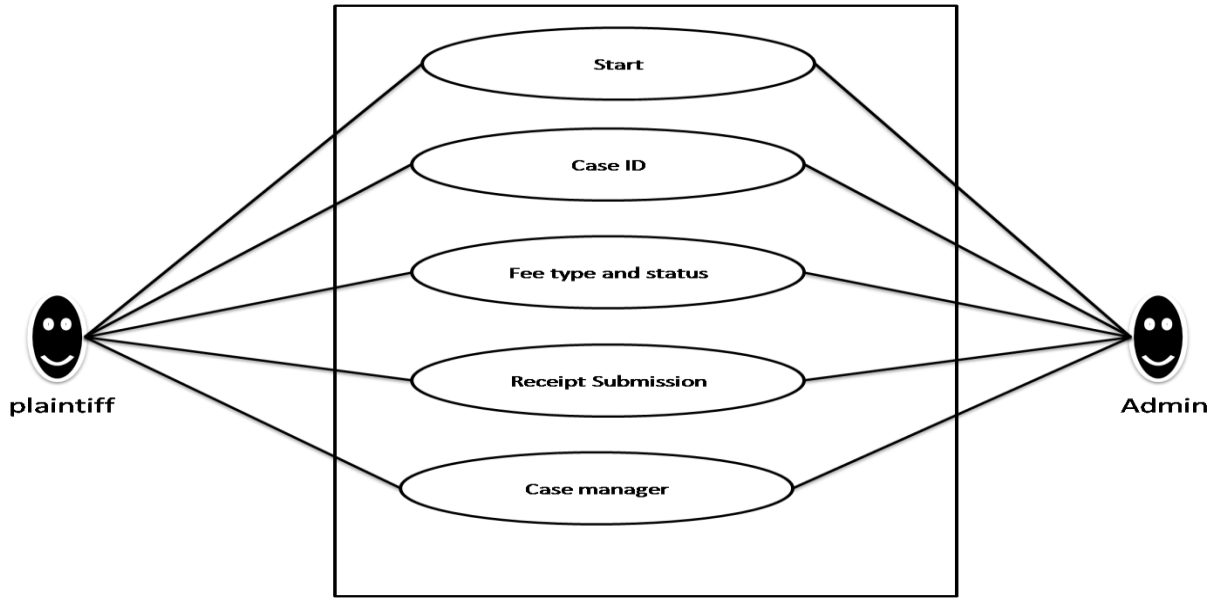

Figure 4: The use case for payment information system

Brief description: The use case begins with the initiation of a case (Step 1). Each case is uniquely identified by a Case ID (Step 2). The third step involves recording and tracking the Fee Type and its current status within the case. This could include information about the type of fee associated with the case (e.g., processing fee, service fee) and its current status (e.g., pending, paid). Following that, there is a step related to Receipt Submission (Step 4). This suggests that there is a mechanism in place to document and manage receipts associated with the case. It could involve capturing information such as the date of receipt, amount, and any relevant details pertaining to the financial aspect of the case. Finally, there is a mention of a Case Manager (Step 5). The case manager oversees and coordinates various aspects of the case, including monitoring fee status, receipt submission, and overall progress.

In summary, this use case outlines a structured process for managing cases, incorporating unique identification, tracking fee-related information and status, handling receipt submissions, and assigning a dedicated case manager for effective oversight and coordination. The details within each step would depend on the specific context and nature of the cases being managed.

Pre-conditions: it was assumed that the plaintiff already made the payment and is submitting information for the conformation of payment

Post-conditions: after the payment verification process, the case is scheduled and processed for hearing.

Main flow of events:

1. Start
2. Case ID
3. Fee type and status
4. Receipt submission
5. Case manager

The next figure 5 presents the use case for the witness information management system. The information flows are;

Main flow of events:

1. Start
2. Case ID
3. Witness profiling
4. Witness document submission
5. Case manager

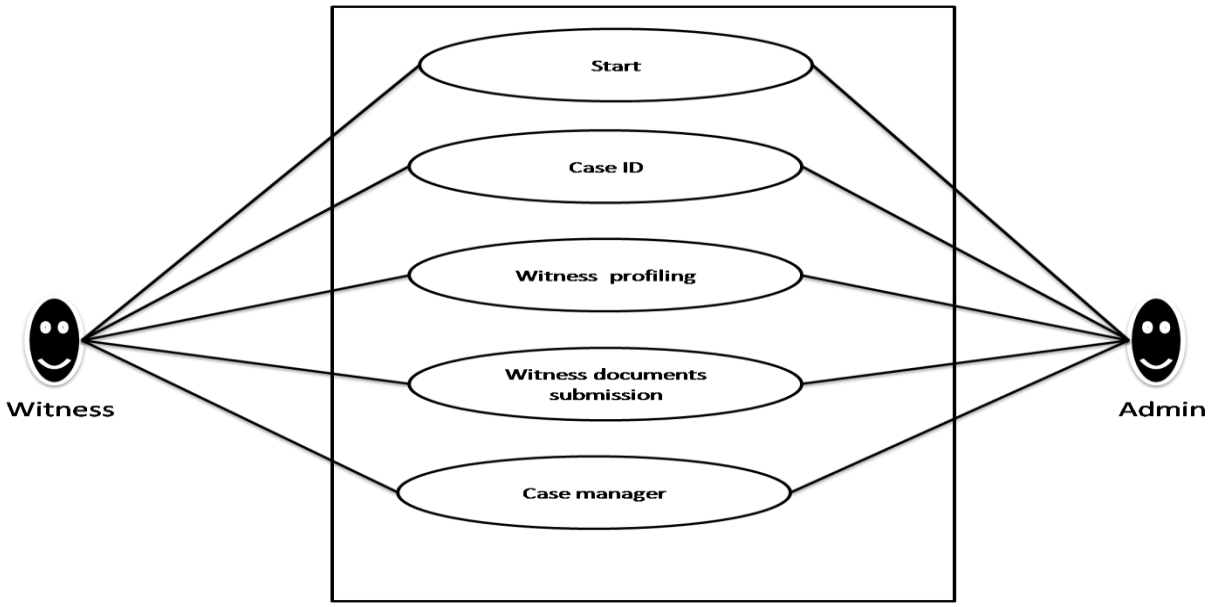

Figure 5: Use case of witness information system

Brief description: The use case in figure 5 outlines the structured workflow for the witness information management system. It begins with the initiation of the process, followed by the assignment of a unique identifier to each case, denoted as the "Case ID." The subsequent steps involve the profiling of witnesses associated with the case, encompassing the collection and recording of personal details. Following witness profiling, the use case includes a step for the submission of witness-related documents, implying a systematic approach to managing evidence and statements. Finally the case management system was used to store and manage these submitted information for verification to process the case for hearing.

Pre-conditions: it was assumed that the witness already have documents which serves as evidence for the case

Post-conditions: after the witness profiling and documentation process, the case is scheduled and processed for hearing

6. Results of Design Validation

This section showcased the results of the system implementation, displaying the interface results for each components of the court case management system**.** The figure 6 reported the output interface result of the user authentication system.

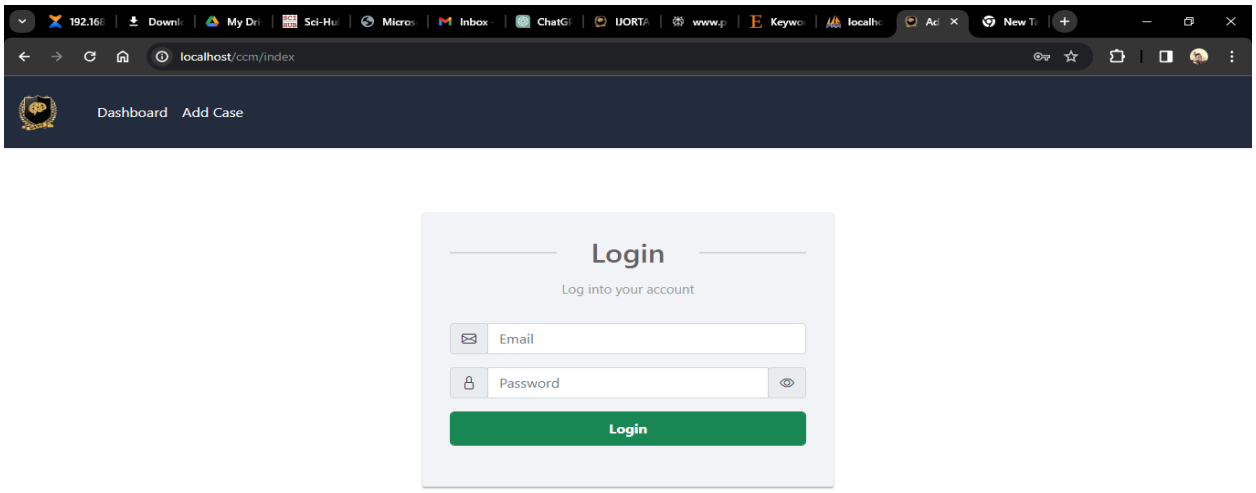

Figure 6: Login authentication section

The figure 6 presents the login authentication section of the system, showing how the user admin is granted access to the network, using username and password. After the registration process, the dashboard for profiling where the plaintiff information is submitted is reported in figure 7;

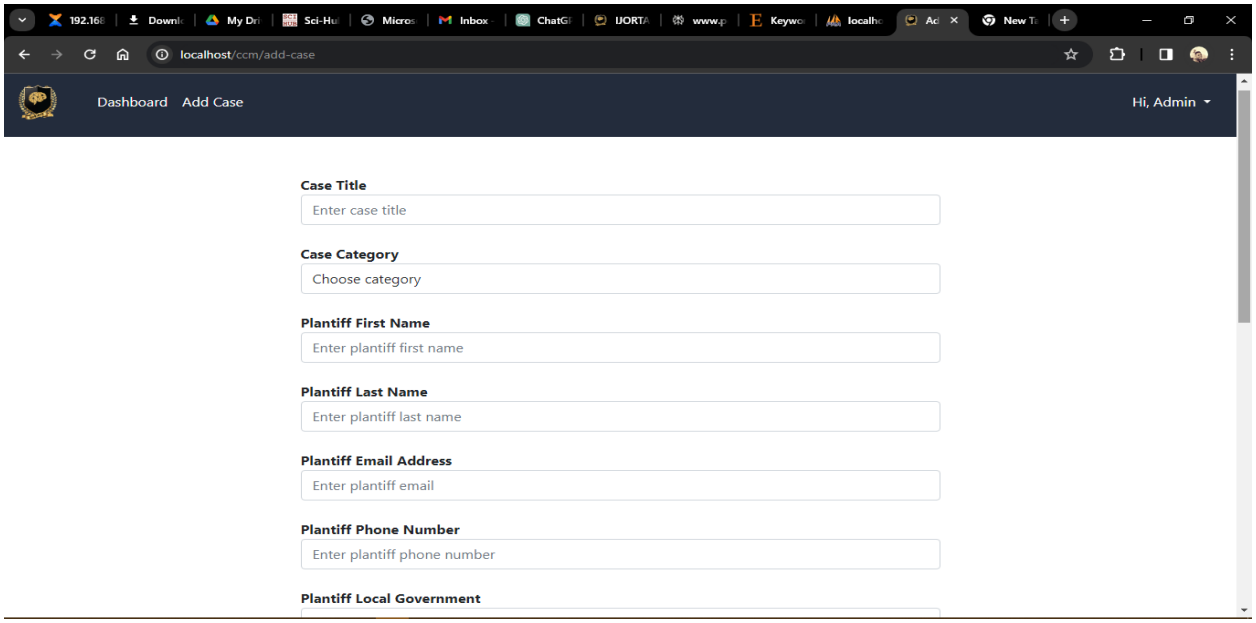

Figure 7: Dashboard for profiling of plaintiff

The figure 7 presents the result of the plaintiff profiling section which showed where the admin can register information of plaintiff as in the table 4, and then store in the case management system. Similarly, the dashboard for figure 8 reported registration section of the defendant where profiling is made and submitted by the management system.

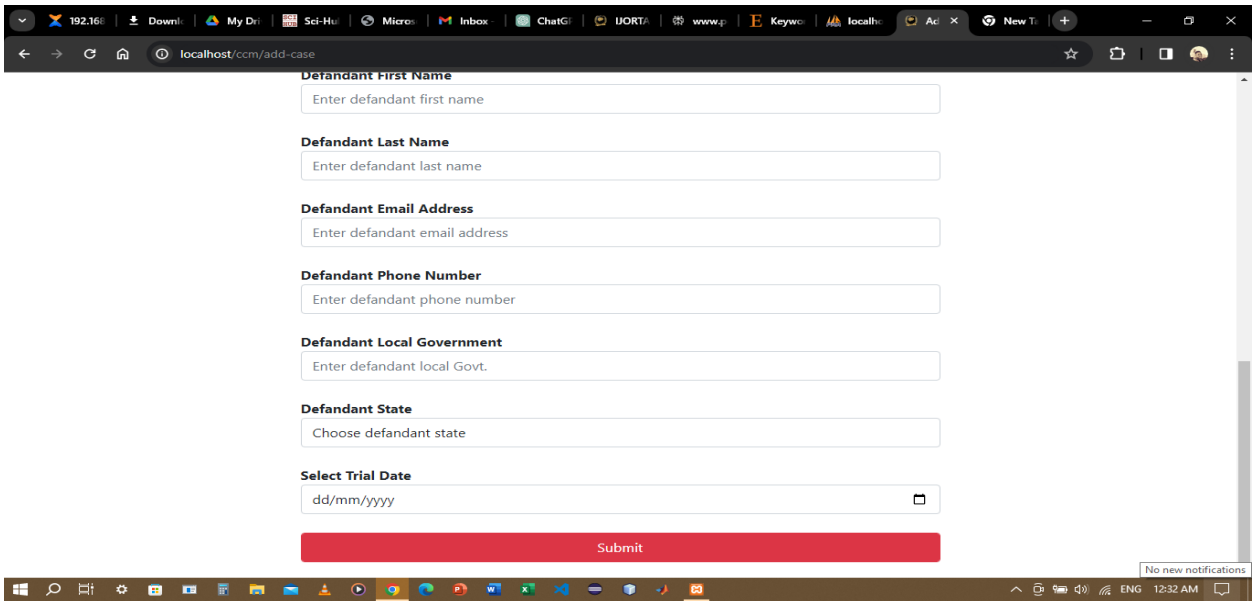

Figure 8: Dashboard for user registration

The figure 8 reported the output interface of the user registration process, showing where information of the use are collected and stored to the case management as modeled in the table 1. The next result in figure 6 presented the case management output result which showed where the cases can be viewed and also where the information submitted by the users can be visually managed to determine the type of cases and other user information which is necessary to process the case. In addition, the figure 9 presented the case management interface showing the dashboard for management of cases such as manual sorting, searching, printing and visual analysis.

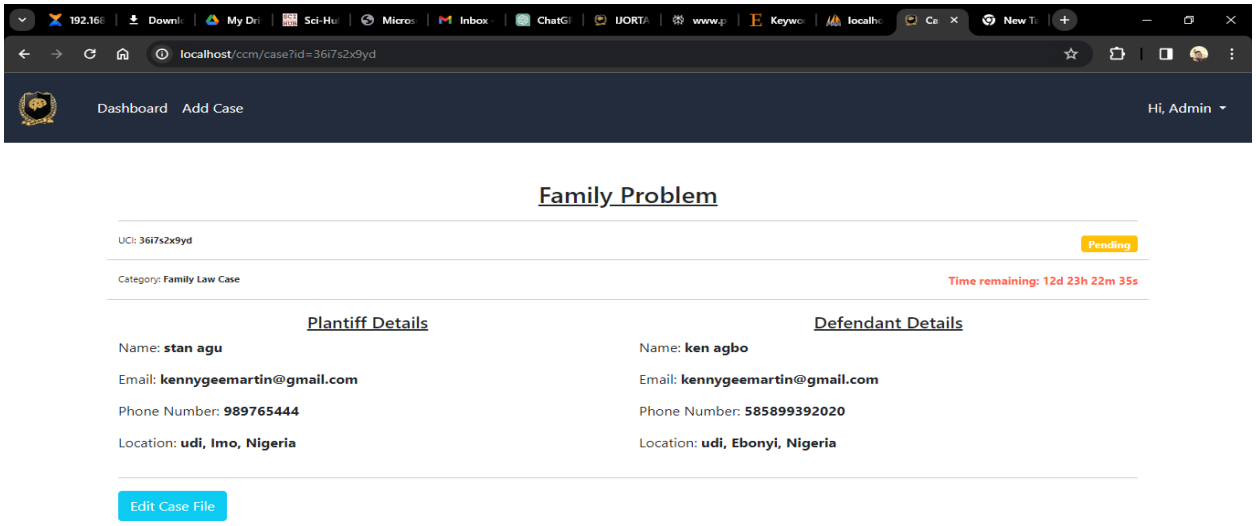

Figure 9: Output result of the case management

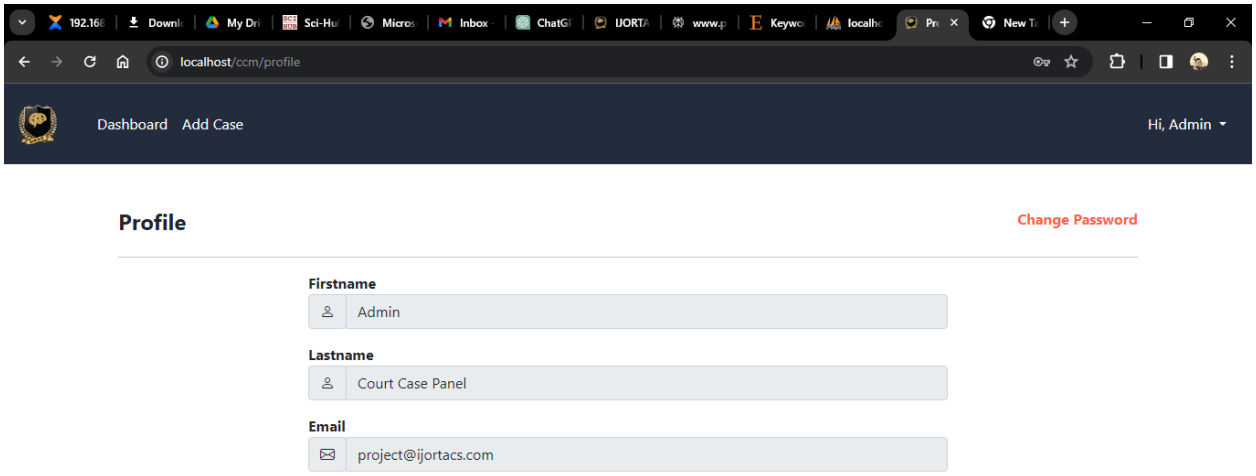

Figure 10: Output result of the case management

Figure 9 represents the output result of the case management process. This includes visual representations of data summaries related to case management, offering insights into various aspects such as case status, progression, and email, case panel, etc. The figure 10, serves as a visual aid to help stakeholders understand and assess the overall performance and outcomes of the case management system.

7. Conclusion

The imperative for efficient case management and the prompt delivery of justice has become increasingly evident, catalyzing the development of electronic court case management system. This study addresses shortcomings in the existing system currently in use at the Enugu State Customary Court by implementing an automatic case scheduling scheme and introducing an automated tracking and notification system. The electronic court case management system, implemented with high-level programming software, serves as a strategic response to the increased demands for streamlined case processes in Nigeria. This research contributes to the evolution of case management practices, underscoring the significance of technology-driven solutions to meet the increasing demand for a more effective, fast, and reliable case management system.

8. Constraints and Limitation of the study

Due to time constraints such as finance and time, the research were unable to subscribe to the plug-ins which facilitates the payment section of the modeling. This serves as the limitation of the work, however it recommended that future studies can adapt the model to their design and then implement the payment platform, help facilitate a holistic system for court case management and judicial administration in Nigeria.

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