



## **CLINIC MANAGEMENT SYSTEM**

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### **Abstract:**

*This study explores the implementation and benefits of a Clinic Management System (CMS) in healthcare settings. It focuses on the objectives of the CMS, including eliminating errors in form writing, establishing standardized processes and data formats, and generating reports for doctor scheduling and patient disease data storage. The study discusses the challenges faced by clinics in traditional manual-based systems, such as errors in form writing, lack of standardized processes, and the absence of robust reporting mechanisms. It highlights the significance of transitioning to a digital platform for minimizing errors in form writing and emphasizes the importance of intelligent form validation and auto-correction features.*

**Keywords:** *Clinic Management System, error-free operations, standardized processes, data formats, workflows, efficient reporting, patient care, operational efficiency, data accuracy.*

### **Introduction**

This is the introduction section of a report for a management system. It will provide an overview of the application and its project background, problem identification, objectives, significance, scope, assumptions and limitations. Information about the management system will be included in the background section of the report.

#### **A. Project Background**

A clinic management system which calls CMS in short is a management system which specially designed for most of the general clinic for keeps track their daily clinic operation information.it gives you a unified managing patients,doctor, inventory, billing information ,finances and more. In the clinic management system, there is a problem that is an obstacle to the user of the management system. The system implemented by several clinics is a separate management system so that the management system that handles certain fields is in its own management system making it difficult for users to

operate it. The problems that exist in some clinics have advantages and disadvantages. The drawback is that users who operate the management system themselves have difficulty in operating it because they have to open the management system one by one when entering data according to these fields. Based on the problems above, this proposal will build an application clinic which can be operated by users becomes easier without having to open one by one in operating the application. The implementation of the system uses a database Microsoft Sql Server as back end and Visual Basic as front end .

#### B. Problem Identification

The problem statement that can be highlighted throughout this research are:

1. The use of paper-based forms for patient registration in clinic which makes many mistakes such as unclear writing, incorrect data entry and many others.
2. The absence of a standardized approach to managing clinic operations across different fields can lead to inconsistencies in data formats, processes and workflows, posing challenges in data management and analysis.
3. Data collection, search for medical record data that is less effective.

#### C. Objectives

The main objective of this project are:

1. To develop Clinic Management System, there are no more errors in writing in the form.
2. To establish standardized processes, data formats and workflows across different fields in the clinic management system, ensuring consistency and accuracy of data management and analysis.
3. To generate report such as scheduling doctors on duty and storing data on diseases experienced by patients.

#### D. Significance

This part of the research contains few beneficiaries. The first one would be to successfully create a software where patients can add and edit patients easily and efficiently. Not only that, this system also creates a queue numbering feature that can be choose by patient when a patient is registered on a software and also makes an online appointment for patients who can choose a date to make an appointment. Lastly, this system creates a feature where patients can registering online so that the clinic of patients who want to be treated as patients with the correct identity.

#### E. Scope

A scope of work is a list of tasks that must be completed in order for the project to be completed within its specified boundaries. The work scope is important for ensuring that the project is on track to meet its objectives. The goals of this project are to build a software management system.

### LITERATURE REVIEW

This chapter consists of various components including ideas, the finished thesis, generalizations or conclusions, methodologies and others. These elements are included to provide relevant information and familiarize readers with the present study. Review of the related literature helps the researcher to understand the current knowledge in the field and identify the limits of the research area. It enables the researcher to define the

problem, avoid unprofitable and ineffective problem areas, prevent duplication of established findings and select problems for further studies based on previous research suggestions. Maintaining the Integrity of the Specifications

#### A. *Review of Current Situation*

##### 1) *Medical Card*

The current practice in many clinics of manually keeping patient records using medical cards. These cards are printed and contain brief patient information, including visit dates, diagnoses, and treatments for each diagnosis.

##### 2) *Scheduling*

Automating appointment scheduling not only saves time but also has the potential to significantly reduce expenses. Missed appointments cost the U.S. healthcare system billions of dollars. By utilizing clinic management software, clinics can mitigate missed appointments and associated costs. The software offers various functionalities to support scheduling, such as patient appointment scheduling, appointment reminders, online scheduling, color-coded calendars, patient intake forms, and telehealth appointments.

##### 3) *Billing/Payment*

Medical clinic management software streamlines billing tasks by automating claim submissions, minimizing errors, verifying insurance eligibility, and providing financial checks and payment plan options for patients. These features save time and improve the efficiency of billing operations within a healthcare practice.

##### 4) *Patient Information*

The accessibility of patient records as a significant advantage of health clinic software, particularly in terms of saving physicians' time. Medical clinic software allows physicians to effortlessly access patient information, including medical history, medications, diagnoses, allergies, and more. Instead of searching through physical paperwork, physicians can retrieve this sensitive information with a simple click.

##### 5) *Reporting*

The importance of comprehensive reporting functionality in medical clinic management software. This feature enables effective communication between the clinic, patients, and insurance companies. The software allows users to generate and store reports quickly and conveniently in one place.

##### 6) *Inventory Management*

The complexities of inventory management in medical clinics and presents clinic management software as a solution to streamline the process. Managing multiple supplies, including durable medical equipment (DME) and pharmaceutical samples, and ensuring they are readily available and properly stored can be challenging.

### *B. Review of Related Literature*

Interoperability concerning a specific task is said to exist between two applications, when one application can accept data from the other and perform the task in an appropriate and satisfactory manner without need of extra operator intervention. One of the main challenges in introducing patient healthcare records is the development and use of systems that advance communication and information sharing. Sharing information is an essential aspect of communicating with colleagues and patients about delivery of care. The absence of instant access to patient healthcare information is the cause of one-fifth of medical errors. Many healthcare professionals work autonomously, the deficiency of accessing vital healthcare information segments and shared knowledge can produce duplicate clinical tests to be arranged and leads to additional cost, pain and danger. Hence, connected and unconnected electronic systems should be coordinated and interoperable i.e. healthcare information is accumulated and stored into an electronic holding place called as Data repository. All relevant data would be shared between healthcare professionals in the same or different organizations”. “Indicates that one of the important issues in paper-based records are, all the clinical information is written in free style and chances are high to miss or forget some important information, as this will lead to serious effect on patient’s treatment and care. The case sheet is a hard copy that can be accessed by one person at a time and needs physical transfer for other physicians to access. “Retrieving a record will be a hard task given number of medical records present and missing a record won’t be a surprise in a huge pile of paper based medical records. Moreover, with time, information in paper records gets diminished of ageing paper and ink, even fire accidents or natural disasters can ruin the archive of paper records”. Explains that all the above discussed issues can be over-come by implementing EMR/EPR systems, it can not only solve the problems but also improves the efficiency of healthcare by increasing accessibility and needs less resources to maintain records. EPR system can be used as a resource of researchers, it will be a tool for disease surveillance, which can be used for public health initiatives and for practicing Evidence based medicine. The invention of the computers has brought about the revolution of Information Technology (IT). In the past few decades, offices, factories and business have increasingly adopted the use of computers to enhance their performances and outputs. Along with that, today, computers can be found in every household as well. There are significant advantages of using computers in medical institutions. In recent times, their importance has grown manifold, due to the fact that the procedures have to be speedy for catering to a larger population and the medical services have to be more precise. in the committee of nations, Nigeria often denotes fraud and corruption. The extent of involvement of fraud perpetrators in Nigeria and those operating outside the shores of the country is unquantifiable. stated that fraudulent practices range from online identity theft, marketing of non-existent goods, prosperity churches, false non-governmental organizations soliciting funds from foreign donors, to outright imposition by persons as government officials awarding bogus contracts. The activities of corrupt elements in society have tarnished the social and corporate image of the nation, causing a drought of foreign investment in the country . Corruption exists in every facet of life in Nigeria and has negatively affected the willingness of international investors to do business in

Nigeria. The engagement of the larger society in corruption occurs by ambivalent complicity. Sustained aiding and abetting of corruption in the Nigerian society makes it Nigerian impossible for the nation to rise above mediocrity in almost every area of socioeconomic endeavour including health care. In a study of the framework for implementation of e-commerce in Nigeria, the abysmally low internet-access in the country. Internet connection enables affected data management system, picture archiving and communication system and specifically important for running radiological information system and teleradiology. Other requirements include well-trained health care workers and information system administrators because of challenges involved in integrating new hospital information systems with old paper documentation and record systems, clinicians and other health care practitioners may become encumbered with multiple and conflicting sources of patient information. Multiples of paper and electronic documentation may disrupt a seamless workflow and influence the quality and efficiency of service delivery. These circumstances also have the potential to cause new types of medical errors resulting from poor harmonization of patient information. Understanding these concerns requires examination of human factors in the design of technology that is able to adapt to the way health care providers do their job. The delivery of patient-friendly services demands that health care providers continue to work toward improvement in the method of care pathways and processes.

### C. Review of Related Products

**Table 1 Comparison Product**

<b>Comparison Product</b>				
<b>Features</b>	<b>Clinic Pro Medical Software</b>	<b>PappyJoe</b>	<b>Encore Clinic Software</b>	<b>Clinic Management System</b>
Login	No	No	No	Yes
Payment/Billing	Yes	No	No	Yes
Medicines	No	No	No	Yes
Reporting	Yes	Yes	Yes	Yes
Schedule of Staff	No	No	No	Yes
Appointment	No	No	No	Yes
Access User	No	No	No	Yes

### Method

The software development methodology for the clinic management system follows the Software Development Life Cycle (SDLC), encompassing planning, requirements analysis, design, development, testing, deployment, and maintenance

phases. The project addresses the lack of an integrated clinic management system, proposing a user-friendly application. The hardware and software requirements include programming languages, an integrated development environment (IDE), a database management system, and a version control system. The system design involves input-output processes, activity diagrams, deployment diagrams, and various user-related diagrams. The findings and discussions in the chapter analyze the system's deployment results and their implications for clinic operations. The project's phases, from login features to administrator and doctor displays, are visually presented. System testing evaluates user logins, registrations, and functionalities, ensuring a successful implementation. The comprehensive methodology aims to ensure a structured and effective clinic management system.

## Results and Discussion

In this chapter, the findings and discussions derived from the implementation and evaluation of the proposed clinic management system. The primary objective of this chapter is to analyze the results obtained from the system's deployment and explore the implications of these findings for the clinic's operations and overall management. This chapter serves as a platform for presenting a comprehensive overview of the system's effectiveness and its impact on various aspects of clinic management..

### Project Findings

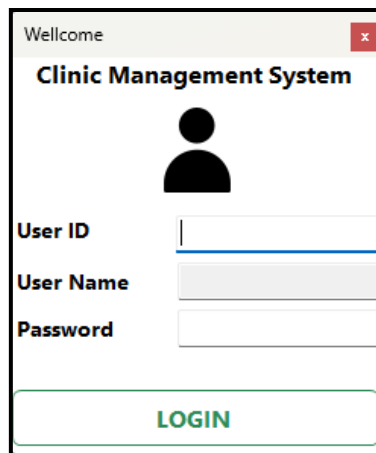


Figure 1 Login Clinic Management



Figure 2 Administrator Display



Figure 3 Administrator Feature Medicine

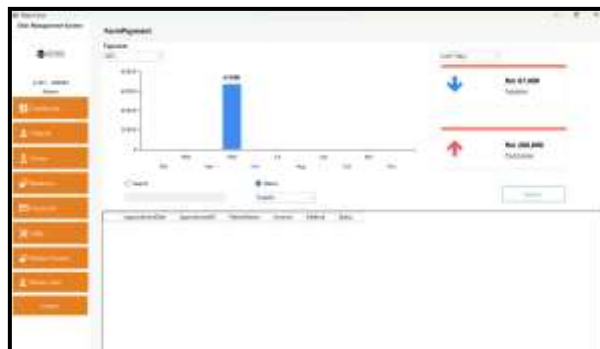
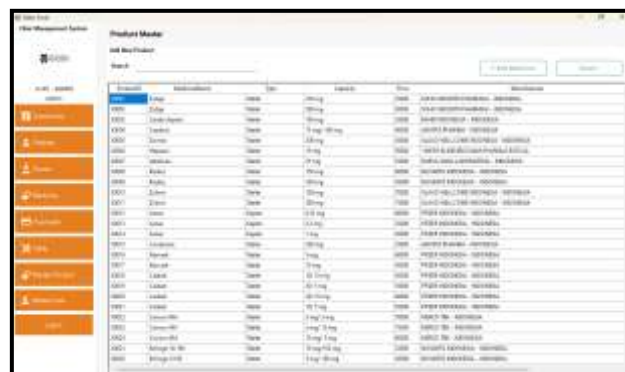


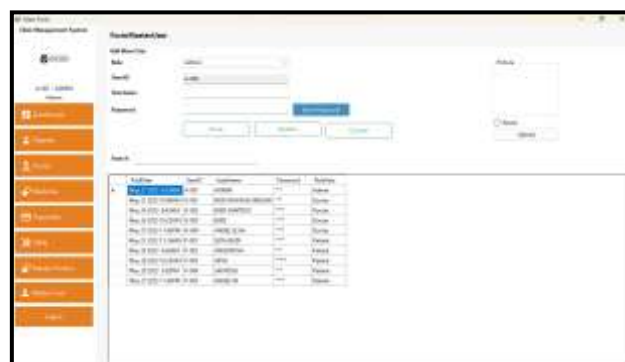
Figure 4 Administrator Feature Payment



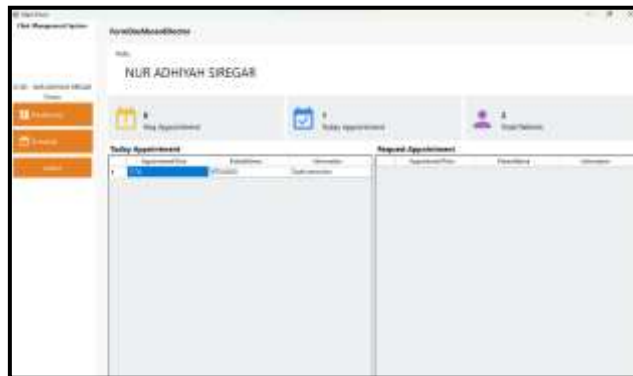
**Figure 6 Administrator Feature Utility**



**Figure 7 Administrator Feature Master Product**



**Figure 8 Administrator Feature Master User**



**Figure 9 Doctor Display**



**Figure 10 Doctor Feature Schedule**



**Figure 11 Patient Feature Appointment**





Figure 15 Administrator Feature Doctor

## System Testing

Table 2 Sytem Testing

Test	Description	Input	Expected Result	Pass/Fail
TEST 1	User is able to log in to the system	Enter the username and password and click "login" button	Validation Clinic Management System	Pass
TEST 2	User is not able to log in to the system	Incorrect enter the username or password	"User not Found"	Pass
TEST 3	Administrator is able to register	Enter all information need and click "Save button"	"Success your account has created successfully." message box	Pass
TEST 4	User fails to register	Not yet entered complete data	Generate message box "Data incomplete"	Pass
TEST 5	Administrator able to print out the medical record	Administrator click the feature of patient	Get the CSV for medical record and give it to patient	Pass

## Conclusion

The development and implementation of the Clinic Management System have proven to be highly beneficial in achieving the stated objectives. Through the digital platform, errors in form writing have been significantly reduced, leading to improved data accuracy and quality. The standardized processes, data formats and workflows have ensured consistency and accuracy in data management and analysis across different fields in the clinic. The CMS's reporting capabilities have facilitated effective doctor scheduling and efficient storage of patient disease data, enhancing overall operational efficiency. The CMS has streamlined administrative tasks, reduced paperwork and improved the accessibility and retrieval of patient information. It has provided healthcare professionals with a user-friendly interface that enhances their productivity and decision-making processes. The system has demonstrated its ability to handle large volumes of data while maintaining data integrity and security. Overall, the CMS has improved the efficiency and effectiveness of clinic management, leading to enhanced patient care and outcomes.

## Daptar Pustaka

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