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Online Diagnostic Lab Management System

Neha B. Suryavanshi, Riya V. Borkar, Puja P. Kupale, Jyoti G. Tekam, Priyanka C. Farde, Deepak S. Bhiogade*

[a] RTMNU, Bhandara,Bhandara and 441904, India
[b] RTMNU, Bhandara,Bhandara and 441904, India
[c] RTMNU, Bhandara,Bhandara and 441904, India
[d] RTMNU, Bhandara,Bhandara and 441904, India
[e] RTMNU, Bhandara,Bhandara and 441904, India
[f] RTMNU, Bhandara,Bhandara and 441904, India

ABSTRACT :

One of the most crucial instruments utilized primarily in diagnostic laboratories nowadays is the online diagnostic laboratory management system. Its primary function is to oversee medical laboratory-related operations. The goal of this project was to create a computer-aided, web-based diagnostic laboratory management system. Our primary objective is to make this software available to the majority of retail diagnostic labs, each of which needs a few minor adjustment points during the installation stage. This method was created to address every difficulty related to handling diagnoses that are manually and locally processed. The system is a management application for an online diagnostic laboratory that requires several online job diagnostics. This system facilitates the tracking of all transactions related to your daily sales and the identification of all clients and staff. Oversee all diagnostic laboratory-related tasks to boost output and optimize revenue. Additionally, the system records every transaction, reducing the possibility of loss.

Keywords: Computerized, web-based, retailing diagnostic lab, customization, challenges, transactions, productivity.

1. Introduction

To replace the current manual paper-based method, an online diagnostic lab reporting system was created for all diagnostic centers. Information on patients, employees, and the diagnostic laboratory information system are all under their control in the new system. The objective is to minimize the time and resources that are now needed for these kinds of jobs by providing these services in an efficient and economical manner. What is a reporting system for online diagnostic tests? In order to run a diagnostic center effectively, a lot of information must be gathered, organized, and acquired quickly. Usually, this data relates to personal patient information, employee data, lab data (including time and results), and payment history. To make the best use of the resources available to your firm, all of this information needs to be managed effectively and economically. The management of diagnostic centers is automated by the online diagnostic lab reporting system, increasing their effectiveness and reducing errors. Its objectives are to reduce discrepancies, guarantee data integrity, standardize data, and combine data. Why employ a method for online reporting of diagnostic tests? Important data is now managed and maintained by hand systems in the majority of diagnostic centers in our nation. Many paper forms are needed for the current technologies, and data stores are dispersed throughout the diagnostic center's administrative architecture. The form's information is frequently lacking or does not adhere to established requirements. Forms are frequently misplaced during departmental transfers, thus a comprehensive audit procedure is necessary to guarantee that no crucial data is overlooked. The Diagnostic Center has many copies of the same data, which might lead to discrepancies in the data between various data repositories. Furthermore, this traditional method of interference is caused by the hospital's daily operations. As you present our online reporting system for diagnostic laboratories, It is safe to state that this well-organized approach will guarantee the smooth operation of any diagnostic center's daily schedule.

2. Methodology

Information technology communication facilitates globalization by highlighting the degree to which various IT tools align with the operations of the firm (IDOWU et al., 2006). The use of information technology in healthcare is always evolving, and in the modern era, timely and appropriate handling of these technologies appears to be a prerequisite for providing patients with high-quality care. Patient-related clinical data (Brailer, 2005). (Cholewka, 2006) shows that a significant shift in the paradigm occurred in the delivery of medical services at a physician's office, with an emphasis on the caliber of patient care;By linking the network in a globalized environment and competing with student cooperation, practice becomes isolated. In tandem with this trend, the health sector has embraced information system advancement and enhancing technology as a commercial strategy to raise the standard of treatment (Wilcke, 2008). Furthermore, according to Mehdi et al. (2004), a strong and robust information system delivers information to the appropriate

individual at the most affordable cost. For this reason, it is necessary to completely modernize the current laboratory data management system in order to enhance data quality, minimize the need for human interface and technician interaction, and reduce support time. the disease's trend. The goal is to create a single point of entry for all patient data and to minimize the magnitude of transcription errors that occur in the laboratory. The world has undergone significant transformation since the introduction of computer information systems, claims Jantz (2001). Both large and small systems have implemented novel techniques utilizing personal computers to fulfill various functions in the information generation process. Therefore, in order to make managing input and output procedures easier, compatible with the patient's recording paperwork. Furthermore, it enhances data for quality control (Liu and Zhu, 2007). A health care system or online laboratory management system is used to manage suitable treatments, give complete patient health data, and make the proper diagnoses; Pay attention to critical health information, insurance details, prescriptions, and unique circumstances. In order to deploy resources, 2.1.1 (Monu, 2010) built a basic information system for the laboratory (Blis). Test samples and data are commonly maintained in this system via manual import techniques and non-standardized packet protocols. The solution is intended to function at medical facilities with little computer hardware and unutilized websites. The labs might experience an outage of electricity at some point. It is crucial in these circumstances to make that Blis data conforms with paper records kept when power is unavailable. Even with the inherent inefficiencies of paper-based methods, working with logs instead of electronic information systems allows for relatively easy flexibility in data entry. The inability of this system to be automated—patients must physically check in—and the requirement that appointments be scheduled automatically is its drawbacks. The patient must then wait longer as a result of this. Health care service quality suffers as a result. created an integrated web-based healthcare administration system (Al Khawlani, 2009). The system is comprised of several primary modules, including the patient, doctor, and appointment booking modules. This is responsible for maintaining the patient record, which includes personal, medical, treatment, billing, and appointment scheduling data. This web-based system is flexible and integrated, allowing for the tracking of all patient, billing, and appointment data. Observe the doctor's appointment schedule as well. Both the patient and the nurse can save time and effort by using this web-based integrated system, which enables patients to access the online system and self-confirm their appointments. Patients will also be able to monitor online the status of their appointments and the availability of their doctors thanks to this integrated web-based system. This offers a comprehensive view of the patient's past medical history, including diagnoses, tests, procedures, and prescriptions. Additionally, it aids users in setting priorities for their jobs, such as Urgent, High, Medium, and Low. Its drawback is that patients are unable to schedule appointments online or modify existing ones. Only manual records, which can only be gathered while the patient is present, are tracked by the system. A system centered on patient appointments was created by (Kopach et al., 2007); appointments can be established several months in advance. All a patient needs to do is give the healthcare department a call and specify their preferred day and time for an appointment to see a doctor. The patient's appointment will be scheduled if a time slot becomes available within a day or two of the preferred date. The patient should give another call later if not. This has eliminated absenteeism, which causes lengthy appointment waits, and improved patient access to physicians while also reducing uncertainty in healthcare operations. Additionally, in a static appointment, all choices about the appointment time are made before to the start of the session; whereas, in a dynamic appointment, the appointment time is changed based on the patient's arrival as well as the session's progress. The appointment booking system has three parameters: "duration," which is the length of the appointment; "block," which is the number of patients arriving at the beginning of the appointment time; and "initial block," which is the number of patients presenting for the initial appointment. 2.1.4 A web-based healthcare system integrating elements like patient management and Nduanya et al.'s laboratory appointment booking management system was developed by Lim et al. in 2006. Online planning and diagnostics for patients All patient invoicing, scheduling, house calls, and correspondence in one all-inclusive system. Portal technologies are used in the development of these components. Users may reach healthcare providers squirrel from a single point of contact with the healthcare portal, which also functions as an integrated portal to the healthcare center website.

3. Related Works

The web-based Online Diagnostic Lab Management System displays a variety of diagnostic tasks online. Prior to logging in using their registered credentials, patients must first register on the website. After registering with their address and contact details, patients may now view the range of tests the lab does as well as their costs. They can also schedule an appointment with an unregistered individual. The lab will send a lab boy to the registered address to collect a sample at the patient's expense after the patient chooses the necessary test and schedules an appointment. The test result is now sent to the user, and the lab will be paid while samples are collected in cash on delivery (COD). Following a successful test, The report can be downloaded by users by the administrator attaching a copy to the system and having it immediately displayed on their end.

4. Modeling and Analysis

In Online Diagnostic Lab Management System, we use PHP and MySQL databases. It has three modules i.e.

1) **Admin.**
2) **Employee.**
3) **User.**

Admin Dashboard: The administrator can quickly monitor all registered users, all new appointments, all approved appointments, all appointments that the admin denied, all appointments that the user canceled, all samples received, all reports uploaded, and all employees in these parts.

Test Detail: The administrator can add and update tests in this section. Worker in the lab: The administrator can add and update employees in this section.

Appointments: The administrator has the ability to view scheduled appointments in this part and can modify the status of appointments based on remarks and the current situation. Lab: The administrator uploads the report as a test in this area after receiving the details of the sample that was collected by the employee. View Users Who Have Registered: The administrator displays user registration details in this section.

Employee Dashboard: The employee can quickly view all newly assigned appointments, all samples collected, all samples sent to a lab, and all appointments in these sections. Test Detail: The employee can view the test detail in this part. Assign Appointments: The employee can view

appointments that the administrator has assigned in this part, and they can modify the appointment's status based on the current situation. Search: The employee can use the patient's name, appointment number, or mobile number to look for specific appointment details in this area. Reports: This area shows the employee how many samples have been collected, how many appointments have been assigned, and how many appointments are still pending. Workers have the ability to amend their records. change passwords, and recover passwords.

User Dashboard: Employees can easily view new general appointments, the cumulative general form, the general absence form, and the general appointment in these parts. Inspection Details: The employee can view the "Look through" part in this section. Employees can examine appointments that have been assigned by the admin in this section. They also have the ability to override appointments based on which employee has the best reputation. Search: Using the requester's appointment number, call, and mobile number, staff members can look up a specific appointment item in this section. Reports: The employee can view the total number of models accumulated, the number of assigned appointments, and the final number of pending appointments in this section. Workers can also receive better passwords, update their records, and change their passwords. Applications utilized Hardware Setup: On the server.

APACHE: The goal of the Apache HTTP Server project is to create and manage an open-source HTTP server for Windows and UNIX, among other contemporary operating systems. This project aims to create a scalable, secure, and efficient server that complies with current HTTP standards and delivers HTTP services synchronously. Since its introduction in 1995, the Apache HTTP ("httpd") server has been the most widely used web server on the Internet, holding the top spot since April 1996. In February 2015, it commemorated the project's 20th anniversary.

PHP: PHP is an acronym for Hypertext Preprocessor. Like ASP, PHP is a server-aspect scripting language. The server is where PHP scripts are completed. Numerous databases (including MySQL, Informix, Oracle, Sybase, Solid, Generic ODBC, etc.) benefit from PHP. PHP is a freely available program. It is free to download and use PHP.

MYSQL: One database server is MYSQL. For both small and large applications, MySQL is perfect. Normal SQL is supported by MySQL. MYSQL aggregates on certain systems. You may use and download MySQL for free. Use http://localhost/phpmyadmin to access MySQL.

5. Analysis and Design

Analysis:

In addition, we had to wait in line to have a blood test at the diagnostic center today. We are heading toward a technological future where everything is available online as a result of the rapid advancement of technology. Thus, we are introducing technology to the medical diagnostics area with the aid of this initiative, enabling patients to take advantage of all diagnostic resources conveniently located nearby. Patients have less stress and the diagnostic process is facilitated by this effort. Simultaneously, it facilitates the tracking of all patient information together with test results for the diagnostic center.

Current system disadvantages:

- Not user-friendly: The data is not saved in the proper structure and format, which makes the existing system user-friendly.
- Manual control: There is a chance of inaccuracy because all ratio computations are done by hand.
- Numerous documents: Since visitors maintain a register, numerous documents must be handled with care.

Design Overview: The process of developing a technology or principle that aims to define a system, apparatus, or procedure in enough detail to make it a reality begins with the design phase. It. program design entails designing, developing, implementing, and testing the three technical tasks necessary to create and verify the program after the requirements have been examined and defined. During this stage, design efforts are crucial since decisions are made based on how well the software is implemented and maintained in the end. The dependability and maintainability of the system are eventually impacted by these choices. The only method to precisely translate client needs into completed software or systems is through design. In design, excellence is promoted. The process of turning requirements into a software representation is known as software design. There are two stages to the software design process. Converting needs into data is the aim of the initial design.

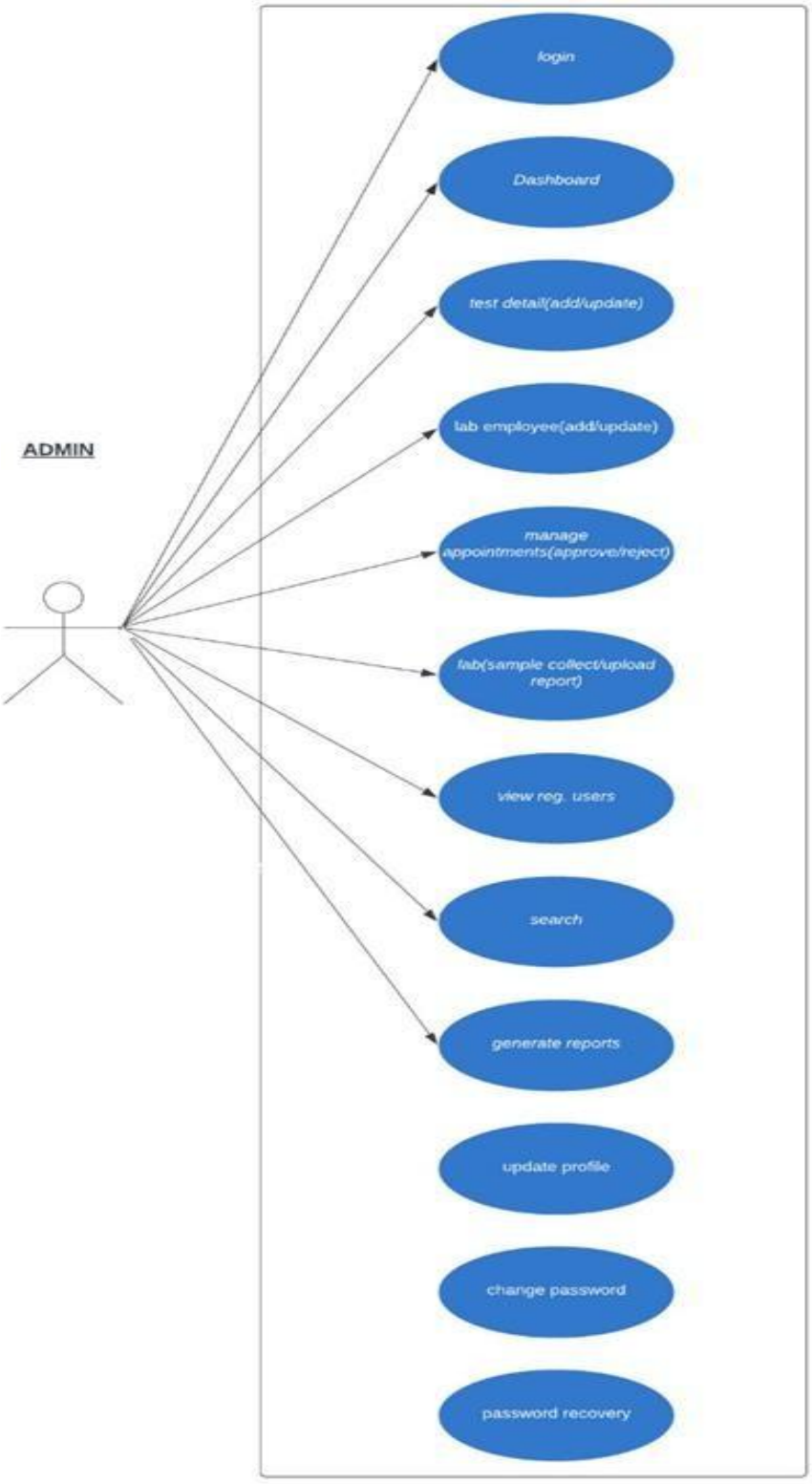

Fig 5.1: Admin use case diagram. Mentioned above in 5.1

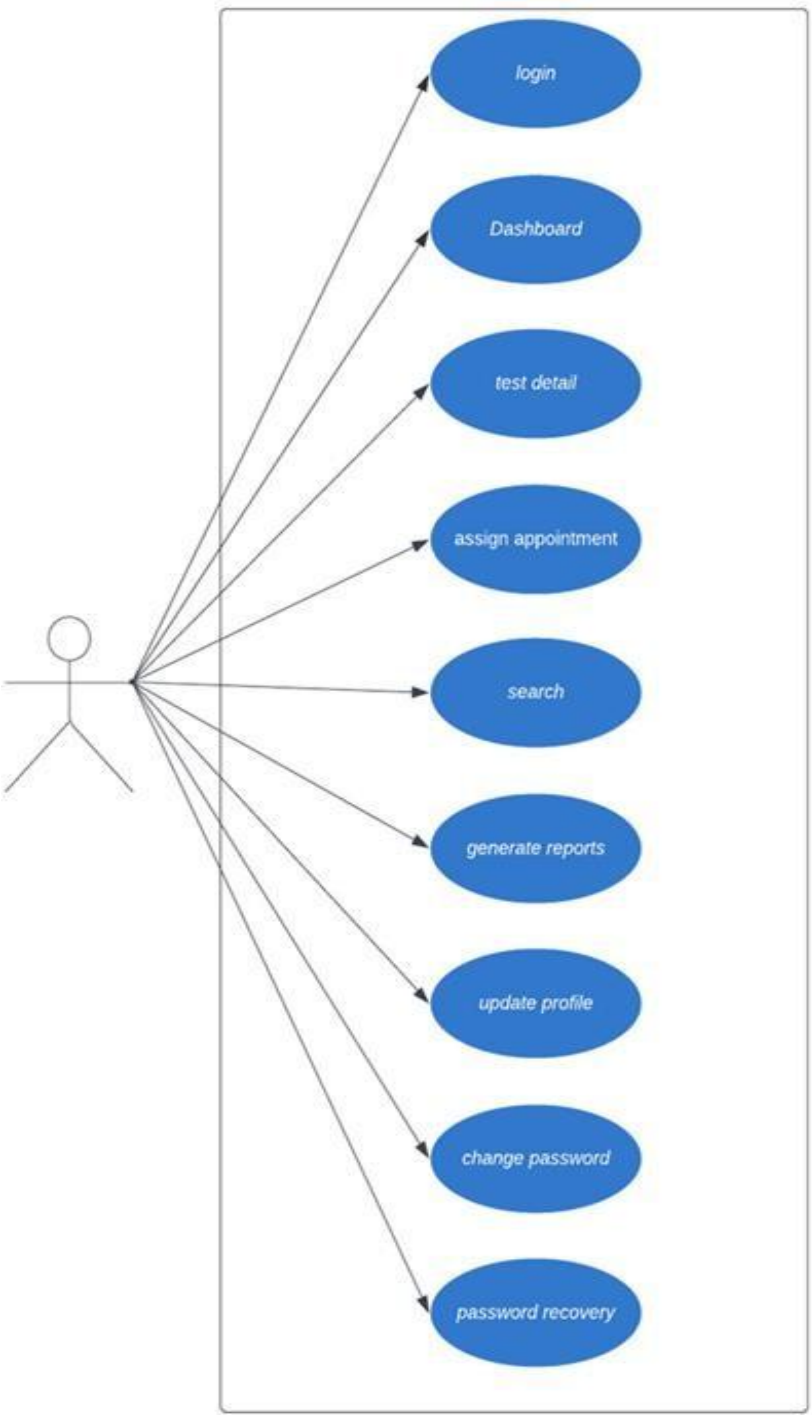

Fig 5.2: Employee use case diagram. Mentioned above in 5.2

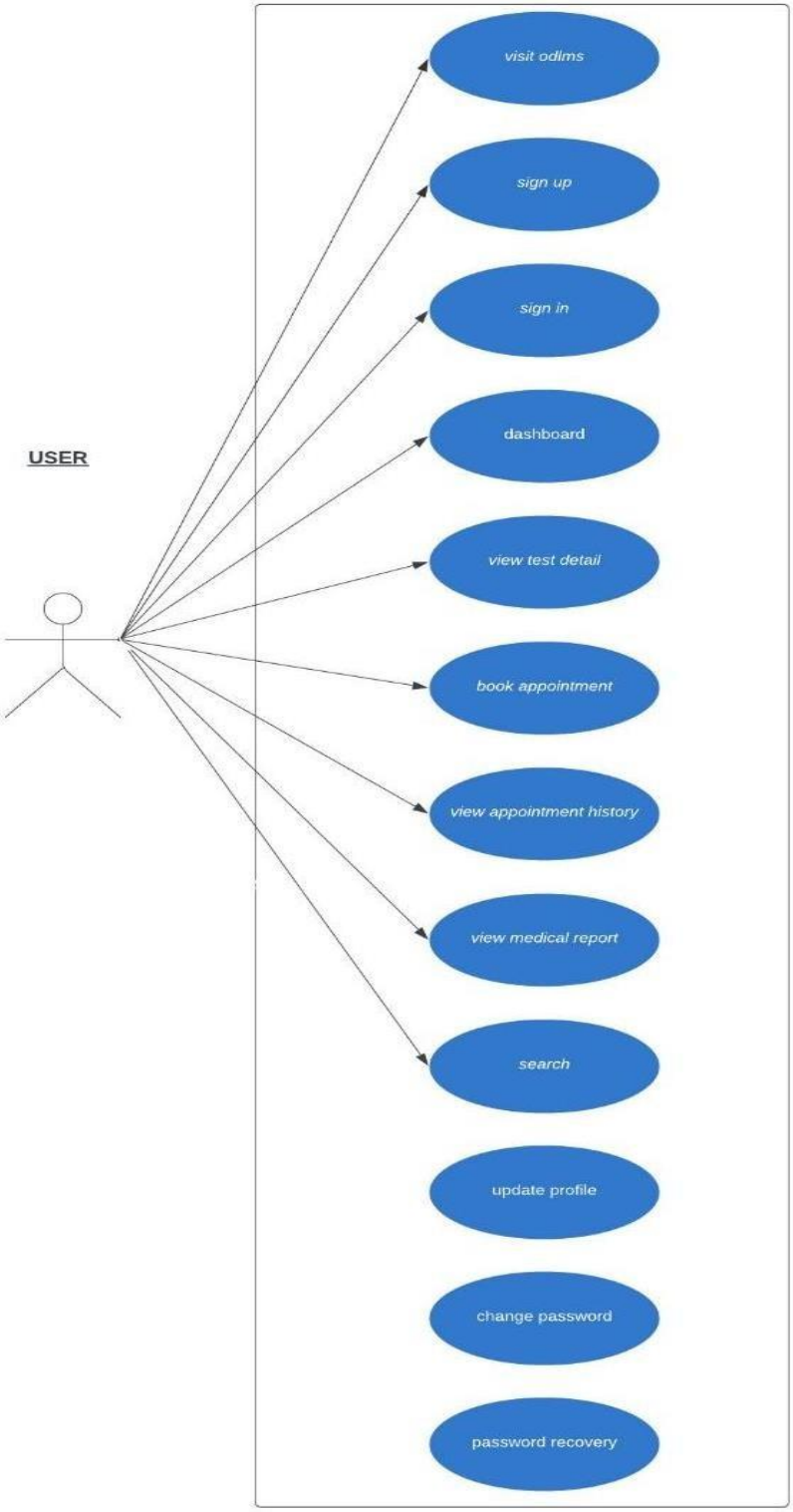

Fig 5.3: User use case diagram. Mentioned above in 5.3

Conclusion

The designed system processes the majority of tasks carried out in a medical laboratory organization in an efficient and dependable manner. Users of the web-based system can schedule appointments for laboratory testing and obtain test results from distant locations. It's an extremely user-friendly graphic user interface. The system also acts as a highly useful data reservoir for laboratory management and medical professionals because it keeps track of patient and user histories. Planning a course of treatment and improving disease and condition diagnosis are two potential benefits of mining this data. It may also be useful in tracking the course of the illness over time and evaluating the response to treatment. The project is essentially financial, technological, and commercial in nature, and it describes the commercial sector's scope and viability in general. Along with providing a

strong return on investment, the project ensures there will be sufficient funds to pay back the loan. Based on a socioeconomic impact analysis, this project has the potential to generate five or more jobs. It will completely satisfy business demands, assisting other companies in growing their operations and provide assistance and support to the sector. generating more cyclical livelihoods and occupations as a result. We can therefore say that the proposal is technically, socially, and financially feasible in every way.

The online diagnostic lab system is incredibly sophisticated and lively. Patients can easily make online reservations after registering their info in the portal. The diagnostic center will dispatch a technician to the patient's address to take blood samples as soon as the appointment is confirmed. The patient can log in to the site and download the test report after the test is finished and generated. Clinics and laboratories that perform diagnostic tests can use this system.

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