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Design and implementation of an automated system for hostel management using cloud technology and app development

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DECLARATION

We, **Chandra Prasad Luitel (20BTRCM026), Yogesh Kumar Shah (20BTRCM030), Ankit Raj jaiswal (20BTRCM010), Sajat (20BTRCM022), Manoj Anand (20BTRCM015)** are the students of Sixth Semester **B. Tech in Computer Science & Engineering (Cloud Technology and Mobile Application)**, at Faculty of Engineering & Technology, Jain (Deemed- To-Be University), hereby declare that the PCL work titled **“Hostel Management System”** has been carried out by us and submitted in partial fulfillment for the award of degree in **Bachelor of Technology in Computer Science & Engineering (Cloud Technology and Mobile Application)** during the academic year **2022-2023**.

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Signature of Students

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“Hostel Management System”

ABSTRACT

In a hostel or dorm there are so many things to keep track of, from managing reservation, accounts, taking care of inventory, assigning chores and many more. The majority of institutions manage their assets, particularly dormitory facilities, using outdated conventional methods. The overall organizational effectiveness has been significantly influenced by outdated inherent constraints. The creation of an automated system for managing dorms or hostel accommodations is suggested in this research to maximize the efficiency of organization and to automate the inherent system. Microsoft Access is utilized to create the underlying database while Visual Basic is used to create the automated system's codes. Additionally, it contains an internal authentication process to guard against unauthorized access. The created solution outperforms the shortcomings of conventional dorms or hostel administration techniques; the system is more graphical user interface (GUI) focused, dependable, efficient, and safeguarded with access control systems.

INTRODUCTION

Our system is designed to assist hostel administrators in saving student records and information about their rooms, as well as avoiding the manual work that makes it difficult to locate student records. The front end of this project uses XML and Android Java, and the back end uses MYSQL. The IDE used is Android Studio. It will add a log, and by doing so, the system will be able to track where the hostel member is. So, the QR Code system will provide the attendance logs when a person has gone in and out of the hostel and every room, too.

This system is intended to help hostel administrators. Hostels are based on a system of patronage and are required to provide accommodation to students. However, not every student is interested in lodging in a hostel. To address the interests of students who prefer to remain independent while attending university, Leading Hostel came up with an app that can help hostels run efficiently.

Hostels can use this app to meet the needs of students and hostellers alike. The Leading Hostel is an app that hosts can use to manage their hostels. Administrators set up the app by translating its functionalities into codes and then inputting them into their devices. Afterward, they can assign tasks and manage their hostels by using the app. This makes daily operations much easier for hostel directors.

Hoteliers can use the Leading Hostel app to meet individual needs. For example, a hostel may want to manage its reservation systems and create a database of all its guests. Alternatively, a hostel administrator may want to create an app for managing his or her staff members and their duties. Hostel admins can use these apps for managing different aspects of their business.

A university student may not have access to advanced access like a hostel owner does, but he or she still requires accommodation at university facilities. To help students who do not have access to hostels, the Leading Hostel app helps them organize group travels at budget prices. It also facilitates group chats between travelers to resolve any issues they may encounter on their trip. The Leading Hostel app provides a platform for managing everyday tasks and organizing group trips at university hostels. These apps help owners run their businesses efficiently while helping students organize independent studies in hostels and budget accommodations at university facilities.

LITERATURE SURVEY

There are similar patterns of modules used in many hostels and dorms worldwide. Hostel Management System Software developed and used currently has mainly six modules (i.e): reservation, accounts, assigning chores inventory, enquiry, visitors tracking modules. Microbes Hostel system is another software that automates and manages the hostel facilities. It has some attractive features such as powerful reservation, synchronization of computers, reception and accounts department, point of sale and reports & statistics. Loventis booking system is another innovative idea that has the features such as property management system (PMS), channel manager and booking engine, plug and play. Addition to this, ,Indocon micro engineers has developed a hostel management software with attractive features like customizing technology, revenue management, integrated web reservation engine and interfaces to all booking channel.

PROPOSED METHODOLOGY

Systems analysis is the process of gathering factual data, comprehending the processes involved, detecting issues, and making workable recommendations for enhancing the system's functionality. To do this, you must research the business functions, and entity relationships, obtain operational data and comprehend the Information flow, identifying bottlenecks, and developing ways to deal with system flaws are all important for achieving corporate goals. Decoupling of intricate operations that constitute the entire system as well as data collection and manual process identification are all included in system analysis.

The design process is an effort toward the establishment of a new structure. The system's precise implementation is the main emphasis of this phase. Logical model and physical design are the two stages of system design.

The researcher defines inputs (references), outcomes (destinations), databases (data stores), and processes (data flow) all in a format that complies with the needs of the user during the logical design phase. Additionally, the analyst describes user requirements at a level that practically controls the flow of information between and within the system as well as data resources. As a result, database design and data flow diagrams are used for logical design. The physical design, or coding, comes after the intellectual design. By creating the design parameters, which specify to the developers exactly what the potential system must accomplish, the physical design creates the functional system. The programmers create the required programs that write the required reports on a physical copy or display them on the screen, take input from the user, process accepted data as needed through calls, and produce the appropriate reports

a.) Existing System

Every year, a growing number of students are accepted into higher education institutions. The infrastructure in these institutions is under a great deal of pressure as a result. The majority of institutions in the developing world employ traditional manual scheduling techniques for facilities management work. This approach has several problems, including human error, poor security, redundant data, management challenges, data update challenges, record-keeping challenges, and data recovery challenges in the event of a disaster, among others. As a result, the authority overseeing the facilities must employ efficient optimization techniques and scheduling algorithms to improve the management of hostel facilities

b.) Software Tool (Programming Language)

Visual Basic (VB) is a 3rd generation event-driven software program and integrated development \environment (IDE). The generation of Developer tools and objects as well as the agile methodologies (RAD) of GUI applications utilizing Shared Data Items, Offsite Replication Objects, or ActiveX Data

Objects are all made possible by Visual Basic. Although they differ in functionality, scripting languages like VBA and VBScript are syntactically identical to Visual Basic. The database management system Microsoft Office Access, formerly known as Microsoft Access, integrates the underlying relational Microsoft Jet Database

Engine with a GUI and software-development capabilities. Based on the Jet Database Engine, Microsoft Access stores information in its format. Additionally, it can immediately import or connect to data held in other programs and databases.

c.) Modular Design

A system is divided into smaller components (called modules) using the modular design method. These modules may be independently built and utilized in other systems to power a variety of functionality.

Module for Administrator Login The administrator has the ability to:

- i. Place various students in various hostels.
- ii. Remove the student from the dorm.
- iii. Ascertain the payment status for the charge.
- iv. Change student records and edit student information.

● Module for Student Registration

Information about the pupils is included in this module, including their registration number, names, DoB, residence, blood type, genotype, mobile number, year, class, room number, guardian name, and contact information. Details are updated and entered here. ● Timekeeping Module

Details about attendance are kept in this module. As a result, each student's most recent attendance is kept up to date.

● Space Module

In this module, students are given a room number in the dorm and their personal information is stored and updated regularly.

● Modules for Mess

Inside this module, the monthly cost of each student's meal expenses in the dorm is calculated, and the cost of each student's meal is computed and presented

d.) Input Design

The control of input requirements, mistake detection, delay avoidance, avoidance of additional processes, and process simplification are the main goals of input design. Data on asset types, depreciation rates, asset transfers, verification/validation checks, calculations, and report production are required by the system. When an erroneous input is supplied into the system, the error detection function included in the program helps to raise a flag.

e.) Process Design

Project development heavily relies on process design. Process design is required to comprehend the operating technique. For process design, we used a tool called a Data Flow Diagram. The conceptual model of the flow of data in the system is a data flow diagram. Different symbols are used to draw the DFD. Each process has a starting point and an ending point. Circles are used to symbolize the process, squares are utilized to represent the source and destination, and lines are used to show data flow.

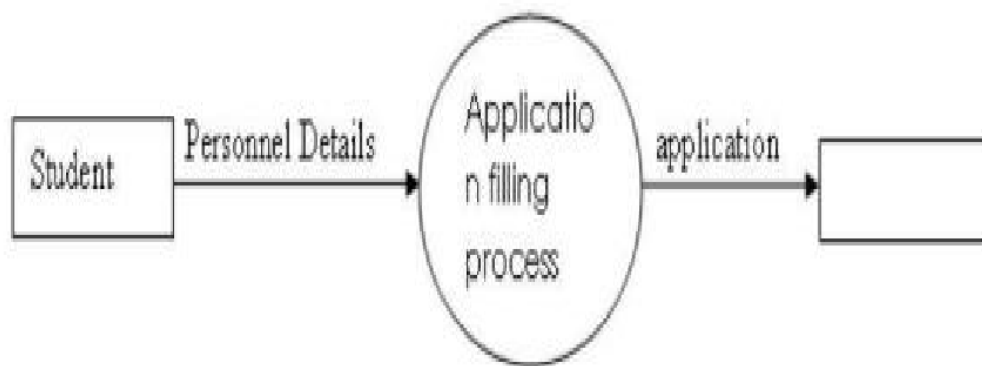


Figure 2: Registration process

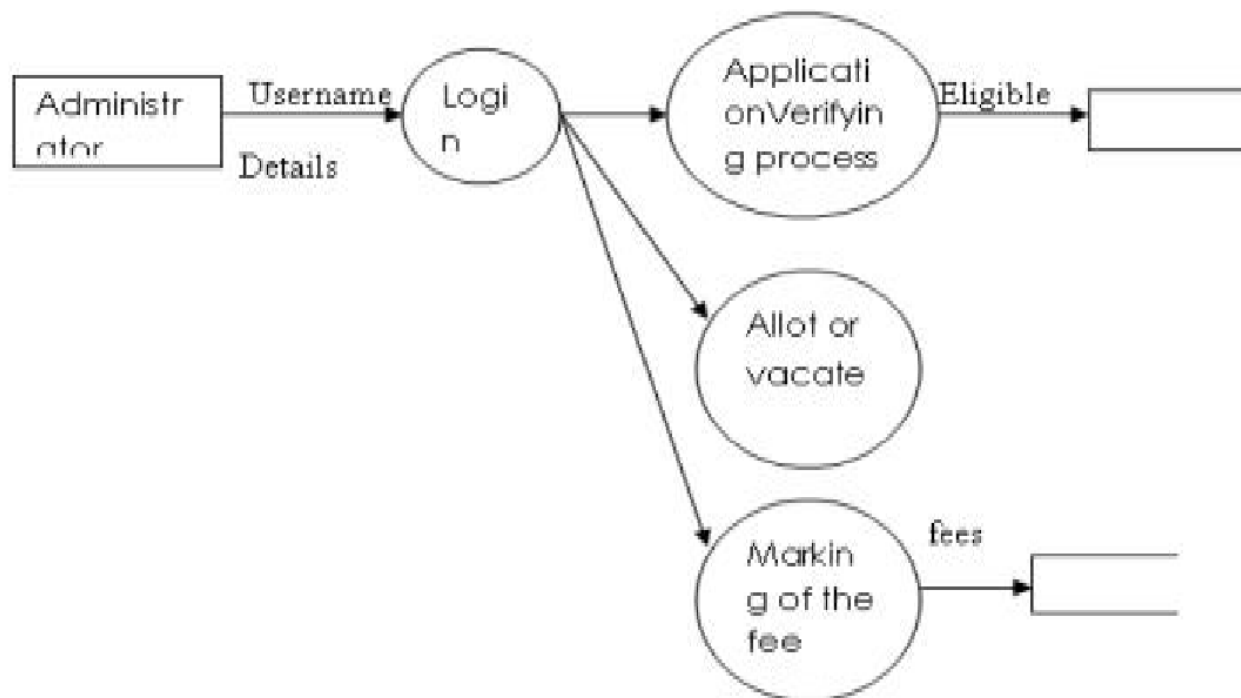


Figure 3: Admin module

IMPLEMENTATION

The implementation of a Hostel Management System involves several steps to ensure its successful deployment. The key steps include requirement analysis, system design, development, testing, deployment, data migration, training, and ongoing maintenance and support.

During the requirement analysis phase, the specific needs of the hostel management system are identified through discussions with stakeholders. This helps in determining the necessary features and functionalities of the system.

System design involves creating a detailed plan for the architecture, modules, and database structure of the system. The technology stack and frameworks required for development are also determined at this stage.

The development phase focuses on coding the various modules of the hostel management system, including user interfaces, database integration, and business logic implementation.

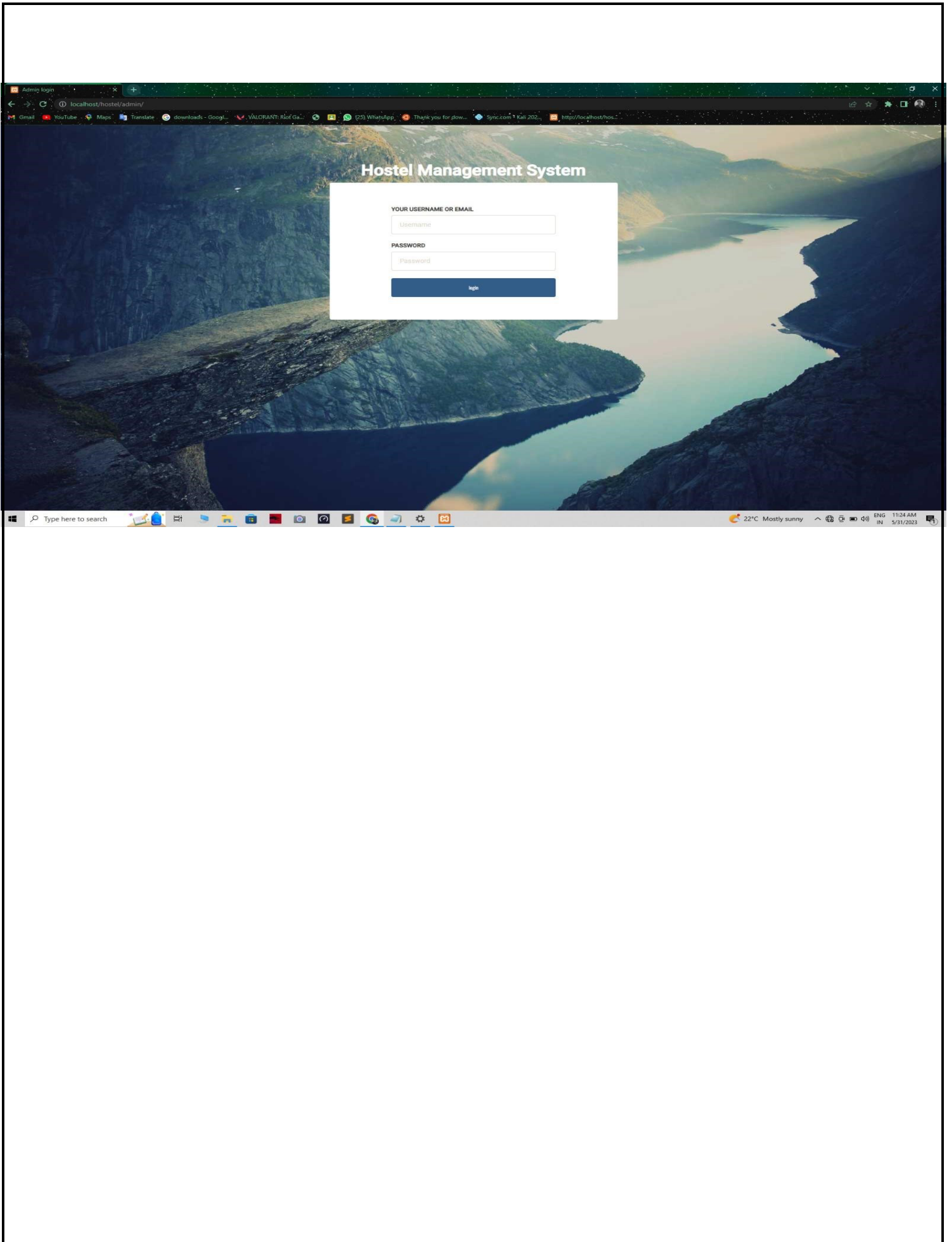
Thorough testing is conducted to identify and fix any bugs or functional issues. Unit testing, integration testing, and system testing ensure that the system functions as intended and meets the specified requirements.

Once testing is complete, the system is deployed in the production environment. Hardware, software, and networking infrastructure are installed and configured accordingly.

If data migration is required, data from the old system is transferred to the new hostel management system while ensuring data integrity.

Comprehensive training is provided to hostel administrators, staff, and residents on how to use the system effectively. User feedback is gathered, and necessary improvements are made based on their input.

Maintenance and support activities are established to address any issues or enhancements that may arise post-implementation. Regular updates are made to incorporate new features, security patches, and bug fixes.



CONCLUSION

A consumer computer-based system for managing hostel amenities at colleges is called the Hostel Accommodation Management System. It is intended to manage, automate, and take care of the whole processing of the records of students living in a sizable hostel. It can manage information about inquiries, students, payments, and other things. The created system contains data such as dormitory info, hostel accommodation information, and hostel accounts information as well as solutions to manual hostel administration issues. The program delivers dependability, affordability, and usability. It gives hostels the most versatile and flexible standards management system option.

Future Scope

Voice interaction with Large Language Model (LLM) has a bright future and a lot of promise. Exciting possibilities arise from merging it with Chat-GPT. Voice interaction enables users to communicate with LLM using speech, exactly like speaking to a human, and provides a more natural and intuitive conversational experience. Numerous industries, including customer service, personal help, education, gaming, healthcare, and more could undergo a revolution thanks to this development. Voice-enabled LLM can improve user experience, create immersive gameplay experiences, deliver fast information and recommendations, and expedite chores. Furthermore, the precision and comprehension of voice interactions with LLM will keep improving as voice recognition and natural language processing technologies evolve. This makes speech interaction with LLM a crucial part of the platform and opens the door to new applications and use cases.

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