Enterprise Resource Planning Based Effective Automated Facility Management System for Local University Accommodation

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Abstract—*The rapid development of technology is causing a revolution in organizational structure. Automated processes transformation of manual ones through technological concepts. It is creating a effective and efficient environment. The enterprise resource planning (ERP) concept is mainly focused on developing a solution to manage the overall process and resources in the organization very effectively. Consider local university accommodation facilitation and management based on a manual process. As a result of the research study's findings, those manual processes have identified failures such as time waste, paperwork, data security, less facility maintenance, and less interconnection with students and administration. Local University accommodations have an important daily maintenance process. Also, students have an interest in living in university housing. So, university accommodation management staff have the responsibility of managing the facilities and services offered to students and creating a comfortable resident environment for them. But practically, it may be very difficult to maintain and continue responsibilities. Some reasons include a lack of management staff, not official communication platform with students, and different academic schedules of students. This proposed system will allow the university to maintain and manage its accommodation facilities and services. Also, this web system, it is the official platform for students to interconnect with accommodation staff.. ERP concept develop an effective and efficient platform for automatically managing the overall process of local university accommodation.*

Keywords-: **Enterprise Resource Planning , automation, university accommodation, facilitate management**

I. INTRODUCTION

Technology is responsible for the world's most rapid transformation every day. It automates the process of process disclosure and combines several operations. Because of this, manual processes have been replaced with automated ones. It is helpful to create an organization process structure that is efficient and unassuming. An ERP (Enterprise Resource Planning) system combines many organizational departments and tasks to increase productivity and streamline processes. This locally developed system for managing university accommodation is based on research, and it uses automation to manage all manual processes efficiently and effectively. ERP is therefore the most appropriate concept. As a result, this system must be maintained using several manual processes. This online application is used to keep track of the procedures for maintaining the university's accommodation facilities and related services, as listed below.

Centralization of Information: A university accommodation ERP system makes it possible to centralize information. This includes data on the students, room assignments, financial data, and other relevant data. To manage effectively, it ensures that all relevant information is readily accessible and up to date.

An ERP system may be used to automate the process of assigning rooms to students. The algorithm may consider preferences, availability, and specific needs when allocating rooms. Additionally, it may handle any special requests, help with scheduling modifications, and change rooms.

Accounting and Budgetary Management: The ERP system can handle student accommodation's billing and financial management needs. It may generate invoices, monitor payments, calculate fees, and oversee all financial activities associated with the hostel. The billing process may be streamlined to create accurate financial records.

Inventory management: An ERP system can make it easier to handle the supplies needed for student accommodation, such as furniture, bedding, and other items. It can monitor inventory levels, automate reordering processes, and ensure that materials needed for the students' comfort are always available.

The ERP system might facilitate collaboration and communication between administrators, staff members who manage accommodation, and students. By utilizing tools that facilitate effective communication for resolving problems, sharing information, and addressing concerns, such as texting, notifications, and online forums, a sense of community may be built inside the accommodation.

Reporting and analytics: An enterprise resource planning (ERP) system may deliver reports and analytical insights on a range of housing-related concerns. Included are the degrees of student satisfaction, maintenance requirements, occupancy rates, and financial performance.

Objective - Developing an integrated, effective, and user-friendly platform that automates each aspect of accommodation management and improves the overall experience for both students and university staff is the goal of implementing an ERP Concept Based Effective Automated Facilitate Management System for Local University Accommodation**.**

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II. RELATED WORKS

Researchers from all around the world are investigating the conception of an automated system for controlling student accommodation and using ERP concepts. The effectiveness of accommodation for universities management systems has been enhanced by international research and literature on ERP systems. The findings of these investigations improve knowledge about the subject.

This research highlighted ,ERP systems offer numerous benefits for organizations, such as enhanced reporting, standardized processes, and real-time information availability. However, improper installation can lead to wasted labor. Successful implementation requires careful decision-making, time, effort, money, and organizational change. ERP systems can have three main effects on businesses: integration, automation, and standardization. Another side the success of ERP systems is closely linked to the proficiency of installation teams and users. Knowledge capacity and aptitude are closely connected. To improve results, ERP systems should be combined with company resources and people to create a competitive edge. A solution that controls knowledge levels in advance is essential for better results.

This research is focus for Sri Lankan university accommodation social background. Most higher education students in Sri Lanka travel by bus or train from rural to urban areas. Furthermore, because higher education in Sri Lanka is fully free, the government has challenges in providing housing for university students as the number of students enrolling in higher education increases. Universities must provide accommodations for them. Student housing might be described as a place that has been made available to students whose homes are far from their educational institution and is referred to as a dorm or accommodation for students.

This is development-based research, university accommodation administration system can manage hostel entries, allocate rooms, address complaints, and provide student reports. This approach benefits students, managers, and administrators by streamlining activities related to student accommodations, such as registration, room assignment, invoicing, and reporting. The system streamlines registration, process efficiency, and saves time, benefiting both hostel personnel and students. Overall, a student accommodation management system is essential for efficient and convenient accommodation management.

The accommodation management system related research is essential for efficient and time-saving accommodation management at Babcock University. It streamlines registration, processing student names and preferences, and allows for easy selection of food plans, places of worship, and lodging halls. The application includes modules for lodging registration, missing item searches, and commenting, simplifying hostel operations, and ensuring a smoother experience for students and staff.

A project aimed at developing a hostel administration system to track and display data about accommodations, with the warden acting as the administrator. The system would display open and closed accommodations, room usage, and student payments. The system would provide administrators with a comprehensive analysis of students who have paid and those who have not. The recommended system uses PHP and MySQL servers.

The identified proposed research solution improves hotel management efficiency by offering safety, data elimination, consistency, easy handling, database updating, less time-consuming labor, and fewer human errors. It involves creating a website for students to register, book dorm rooms, and receive updates on events. Service Now technology automates administrative duties, simplifying hostel administration.

Also this research based proposed solution creates a real-time application utilizing a blockchain-based approach allowing users to reserve rooms in for-profit hostels. The hostel booking system leverages the Ethereum money and is powered by a smart contract created in the solidity programming language. It would be easier to establish the condition of specific rooms inside the hostel by utilizing the blockchain-based booking system.

The UK's education sector based research is expanding due to international student arrivals, leading to a high demand for student accommodation. Most institutions offer adequate housing, but the University of Greenwich now provides only on-campus housing. To address this, a project aims to create a system for local landlords to register and sell their homes, allowing students to book, find information, and find available residential areas.

Mainly highlighted in this research article ERP systems success models are essential for evaluating the execution of enterprise systems. These models consider dimensions such as system quality, satisfaction, personal impact, and organizational impact. End users, who work directly with ERP systems, play a crucial role in the success of business systems. User engagement refers to the involvement of end users in the creation and execution of the system. Understanding the potential contributions users can make is crucial for successful ERP implementation. Misalignment of process features with organizational information requirements can be a problem with ERP adoption. Encouraging users to participate in the system implementation is essential to address this issue and ensure successful implementation.

This research proposed a concept about maintain program manages queries, students, faculty members, and payments for university accommodation options. It includes various panels, such as administrative, informational, undergraduate, dormitory account, mess, and meal. The software reduces administrative tasks and maintains records of students and residents, including room assignment, meal preparation, room transfers, amenities, order, visitor tracking, safety, and other services. Students can perform tasks like room assignments, waiting lists, issuing invoices, and managing individual hostel accounts.

This research concept mainly discussed, the accommodation management module comprises four

submodules: accommodation data, accommodation alterations, purchase, and audit management. Administrators can search for student accommodations, modify them, and update audit management applications. The hostel administration and students will benefit from a simplified housing allocation process, reduced labor requirements, and improved efficiency. This research-based system, designed by students, is user-friendly, GUI-focused, reliable, effective, and secure. It addresses the flaws in manual hostel management by storing information in databases and using a graphical user interface (GUI) for tasks like logging in, making payments, and reserving rooms. Users can also cancel reservations without contacting the administrator. The system will be developed using various frameworks, databases, and methodologies, benefiting both students and the hostel administration.

Finally this research article highlighted, The Accommodation Management framework is a web application designed to streamline dormitory activities and reduce human effort in hostel allocation. It automatically selects students from applicants, handles mess payments, out passes, and registers concerns, making it easier for students and managers.

III. METHODOLOGY

All manual procedures pertaining to university accommodation facilities and management are managed via a web-based facilitation management system. Create this web application for contexts connected to the ERP idea that require a qualitative approach. This technique was effectively employed to coldly assess the concept's addiction. Additionally, it encourages the concept of making use of the history of the facilitation management system for university accommodations. In accordance with the techniques and procedures, the data collecting and analysis methods for this study include interviews, documents, surveys, and content analysis.

a. Refer to related research papers.

This study examines data on ERP systems, university accommodation management systems, facility management systems, and automated hotel management systems from local and international academics. The analysis includes articles, journals, conference papers, publications and reports assessing tacit and explicit knowledge for this topic.

b. Interview

Interviews were scheduled with management and students to discuss accommodation for management and students in private and public universities. Face-to-face interaction is helpful to gain expertise in manual procedures and determine the proper needs of the system. Automation of manual procedures is the foundation of this research.

c. Develop questionnaire.

The management staff of university lodgings as well as university students who reside in campus accommodations are the major audiences for this web application development. They thus require their ideas for facilitation management to be examined.

IV. ANALYSIS

An effective and efficient automated procedure is made possible by the analytical overview of the creation of a web-based lodging management system. Think about the five key elements that have been distilled from past research studies and analytical summaries based on interviews.

a. ERP systems are excellent at managing an organization's entire business operations.

b. The university's accommodation management system is particularly efficient in keeping track of all real-time data record manipulation without wasting time.

c. This facility management system provides a solid foundation for maintaining the link between students and lodging management.

d. less forms to fill out, rapid responses to requests, and a strong platform for parents and children to communicate to acquire accurate information about accommodations.

e. Effective daily processes may be managed, checked, accepted, and maintained using warden.

The analytic summary of this survey is based, in percentage terms, on 42 replies. The effectiveness and efficiency of the present manual procedure for students living in university accommodation is the basis for this particular function. In order to determine the management process's input, it is helpful to know how long they stayed in the accommodations. Therefore, as a high average, 38.1% of students are first-years, and 31% have lived there for more than two years.
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Figure 1- Accommodate periods of students

This query aids in determining the accommodation's manual procedure. Many accommodations employ the notify contact number provided by warden or the matron when some students need to inform leave in the accommodation area. It is 52.5%. If additional students are required for accommodations, the situation is exceedingly challenging.27.5% use letters to let others know about it. Warden wastes time by going over each piece of paper by hand and storing it.
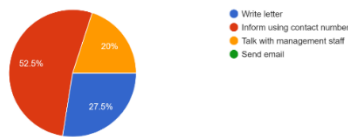
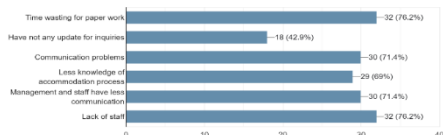*Figure 2- manual process details*

Figure 3- Problem of manual process

As university residents, they are now dealing with a number of issues caused by manual procedures. Following the identification of the major issues, more than 70% of the current students experience issues with waiting too long for assignments, poor communication with facility managers, and a lack of employees to maintain and oversee such facilities. To address such issues, a suggested online system must be created. Establish the primary functional requirements and non-functional needs needed to create a web system after examination.

V. DESIGN AND IMPLEMENTATION

This study focuses on how to run the university accommodation operation as well as more efficiently and effectively online web based application through. The following technique was used to create a accommodation management system in order to archive this.

1. Gather information on the accommodation facilitation management system. The researcher interacts with the existing system and has a role-play session to gain an understanding of how various parts of the system work. The researcher compared the architecture used in the literature. Also, a critical review of the existing architectural models was done to come up with an adaptive architectural model. The reviewed model was scrutinized for strengths and weaknesses to build a more efficient model.

2. Creating a web-based management system for establishments that manage accommodations and provide services. Mainly user login and admin login cerate for maintain both sides to accommodate requests and queries, the manager of the service-related facilities speaks with the management.

3.JavaScript and React Native were both used in the creation of the online application as a front end. Use Firebase as a database. Because Firebase is being used,

fresh data sets are constantly being updated. Therefore, maintaining a cloud-based database is relatively simple.

It is crucial to complete the design process, which aims to build each system need identified during the requirement analysis stage. A system prototype was developed to provide a broad overview of the aspects the recommended system must provide. Because it is the simplest way to describe a system in terms of the phases that make up its sequential process, flowcharts were developed. A Data Flow Diagram (DFD) was produced as a manual for building the system's database. The Entity Relationship Diagram (ERD) was developed to show how the system's data is connected in more detail. A data dictionary was developed to make database design simpler.
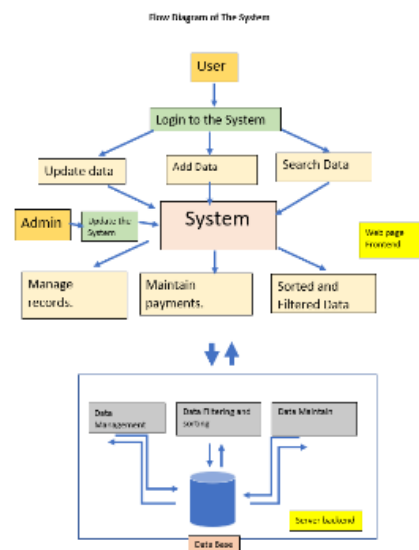

Figure 4 shows the architecture for the proposed system
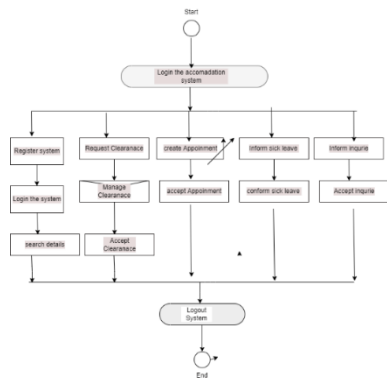

Figure 5. ER Diagram

Figure 6 - Data Flow Diagram

Main functionalities of this system,

1.User (students)

a. Students' registration: after registering, the system creates a profile and sends a QR code of the profile to the student's email.
b. Send room inquiries: send all types of room inquiries to admin. After admin can reply to inquiries,
c. Maintain and request management of services and facilities: request room cleaning, send a request for medical service, send an emergency in/out request, update leave time and details.
d. Search near location: If you are not familiar with the university location, search a map of nearby locations related to food, food services, communications, and hospitals.
e. Request mentoring sessions; When students need any mentor sessions or guidelines, they can send a request for Vorder directly.
f. Update notification or any message use notice board of online platform
g. Online payment of the hostile fee
h. Online room clearance
i. Request a sick report for attendance.
j. Available all of emergency contact number of responsible persons.

2.Admin (warden and staff)

a. Maintain daily records without papers.
b. maintain the history of students.
c. Quickly identify inquiries and get actions.
d. Accept the leave request.
e. Maintain students' profiles.

f. Maintain sick reports for students.
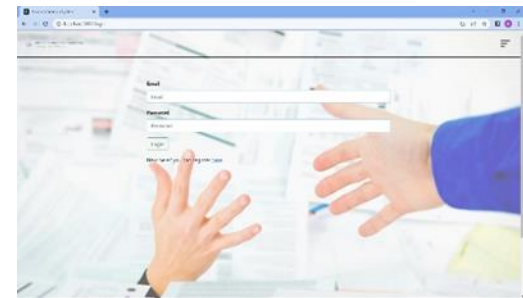

Figure 7. Home Page

Figure 8. Login Page

Figure 9. Room Management Page

Figure 10 – Mentor request Page

VI. RESULTS AND DISCUSSION

The results of this study show that an ERP-based efficient automated management system is successfully implemented and evaluated for nearby university

housing. The system's outstanding performance, great user satisfaction, and increased efficiency in allocating accommodations illustrate the value of the ERP idea in simplifying the operations involved in managing accommodations.

The tremendous time-saving advantages of the ERP system are demonstrated by the large reduction in processing time, notably during lodging applications and room allocation. A seamless and dependable experience for students and university personnel is also ensured by the increased accuracy in housing allocation and money administration.

In general, the university's ERP-based housing management system proved to be a great asset, improving student experiences, maximizing resource usage, and streamlining administrative procedures.

a. Students' registration: effective data storage, easy maintenance of profiles, and quick access to student data

b. Send room inquiries to save time, save students situations, and improve communication with management and students.

c. Maintain services and facilities. quick response, record data, save time, and easily maintain services.

d. Search near location to update location, make it easy for new students, and better understand the accommodation area.

e. Discuss mentoring sessions: quick response for students; protecting the privacy of students; a trustworthy platform.

f. Online payment: easy platform; auto-update payment details of profiles; secure; no need for paper receipts.

g. Online room clearance: save time, save paperwork, and improve response.

h. Maintain a cloud database: no need for space, no cost savings, no need for advanced system updates, easy access.

i. Manage data history: efficacy, no need for paperwork, secure place, quick access.

Consider about the evaluation of this system Using actual data from the university accommodations database, we ran several experiments and tests to evaluate the effectiveness of the designed ERP-based university accommodation management system. also The system's capacity to deliver real-time information on lodging availability and maintenance status received acclaim from users in the open-ended comments. The fact that the system was integrated with other university administration systems, they added, made it more practical and eliminated the need for double data entry. Also By keeping track of how long certain tasks—such as processing student housing applications, assigning rooms, and responding to maintenance requests—took, we were able to gauge how responsive the system was.

VII. CONCLUSION

This study examined an ERP-based facilities management system for student housing, highlighting its benefits such proactive maintenance, improved health and safety, and a clean environment. These advantages imply that facilities management techniques aid in the maintenance and enhancement of facilities. The study also looked at a facilities management system for dorms for students, and it revealed its advantages, including data management, enhanced process efficiency, and preventative maintenance. These results show how crucial and useful ERP concepts are in developing automated, user-friendly solutions. One way the system might be enhanced in the future is by adding a push notification system for real-time alerts to administrators of student applications and complaints.

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