UPLB DMIS: A DORMITORY MANAGEMENT INFORMATION SYSTEM FOR UPLB STUDENT HOUSING FACILITIES

MEGAN DE LEON ECHANO

SUBMITTED TO THE FACULTY OF THE INSTITUTE OF COMPUTER SCIENCE
UNIVERSITY OF THE PHILIPPINES LOS BAÑOS
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE
DEGREE OF

BACHELOR OF SCIENCE
(Computer Science)

JUNE 2024

BIOGRAPHICAL SKETCH

Megan De Leon Echano is a BS Computer Science student from University of the Philippines Los Baños. She developed an interest in web development and computer science as a field of study. She served as the Secretary of UP Peninsulares (A.Y. 2021-2022) and is also a volunteer of the UPLB GABAY Volunteer Corps and the UPLB BARKada at CATropa Animal-Assisted Intervention Program. She is also recognized as a peer facilitator under the UPLB Office of Counseling and Guidance advocating for mental health. She likes to read books, watch shows, and paint.

MEGAN DE LEON ECHANO

ACKNOWLEDGEMENT

I would like to express my sincerest gratitude to those who have helped and inspired me throughout the completion of this special problem.

First, I would like to thank my adviser, Asst. Prof. Fermin Roberto G. Lapitan, for providing support and guidance.

I would also like to acknowledge the UPLB Institute of Computer Science and University of the Philippines Los Baños. I will carry with me all that I have learned, not only in the field of computer science, but also the valuable life lessons that molded me into the person that I am now.

This journey was also made possible by the people I turn to for support and encouragement.

To my superclassmates, close friends, blocmates, UP Peninsulares, UPLB GABAY Volunteer Corps, UPLB BARKada at CATropa, and UPLB Office of Counseling and Guidance, you are my home in UPLB and you have given me the best college life I could ask for.

Lastly, I would like to give a heartfelt thanks to my family, who has been there since day one. I don't know how hard it was for them to accept the journey that I wanted to take. But I made it, and I hope I made you proud by being the first UP graduate in the family.

Contents

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

MEGAN DE LEON ECHANO, University of the Philippines Los Baños, JUNE 2024. **UPLB DMIS: A DORMITORY MANAGEMENT INFORMATION SYSTEM FOR UPLB STUDENT HOUSING FACILITIES**

Major Professor: ASST. PROF. FERMIN ROBERTO G. LAPITAN

The University of the Philippines Los Baños is one of the state universities in the Philippines that offers its own student housing facilities. However, the management system of each dormitory still relies on the traditional way of handling dormers' data with the use of a physical information sheet. The need for a dormitory management information system will significantly alleviate the current process of managing UPLB dormers' information by digitizing resident information and contributing to future-proofing dormitory management in UPLB. The UPLB Dormitory Management Information System is a web application specifically developed to digitize the traditional basic information of UP dormers and alleviate some of the management tasks of UPLB dorm staff. This study presents the development, testing, and evaluation of UPLB DMIS as a technical solution to the growing demands of dorm management. The system was evaluated using the System Usability Scale (SUS). It garnered a mean score of 84.67 which indicates that the web application has an 'A' grading and 'excellent' adjective rating.

INTRODUCTION

Background of the Study

The International Organization for Standardization (ISO) defines a management system as a method used by an organization to run its processes to achieve its objectives and goals (*Management system standards*, n.d.). Without management systems, most organizations may find it difficult to effectively and efficiently manage their processes and services today. As time progresses, companies and organizations must adapt to the call for a better system because of the high demand for their services. One can only imagine if technology hasn't progressed as well.

Technological advancement is one of the keys to the problem of outdated management. An example of technological advancement that helps organizations process information better is the software used in management information systems (MIS). MIS are information systems that complement the needs of people in the organization to collect, store, and process computerized data for making decisions and managing operations (El-Ebiary et al., 2023). With the rise of this trend, establishments, such as dormitories, started incorporating information systems into their management.

Cambridge Dictionary defines a dormitory as a "large building at a college or university where students live" (*Dormitory*, n.d.). They are sometimes referred to as residence halls. Whether these dormitories are outside the hold of the university or part of the university services, they are essential in making college life comfortable for students, especially those who live far from home. On the other hand, the challenge for dormitory managers is to persevere with managing dormers' information and answering the needs of the residents.

The increase in the student population consequently calls for housing facilities that can take the pressure of long-established dormitory processes. According to Kai (2020),

the traditional way of managing dormers' information, such as using pens, papers, and shelves to collect, store, and process data, can be inefficient, making it better to use information technology when dealing with the high demand for queries. With this, dormitory management information systems (DMIS) come into play. DMIS can simplify storing and retrieving dormers' data and processing their requests (Jafrudin & Putra, 2020). This system can benefit large-scale universities, such as state universities, where the student population is usually higher.

The University of the Philippines Los Baños (UPLB) is one of the state universities in the Philippines that offers its own student housing facilities. The Office of Student Housing (OSH) is an office under the Office of the Vice Chancellor for Student Affairs (OVCSA) that provides around 2,300 undergraduate and graduate UPLB students with budget-friendly accommodations inside the campus (*UPLB Dormitories*, n.d.). OSH administers the following residence halls: Women's Residence Hall, Men's Residence Hall, International House Residence Hall, VetMed Residence Hall, Agricultural Training Institute-National Training Center (ATI-NTC) Residence Hall, New Dormitory Residence Hall, Forestry Residence Hall, New Forestry Residence Hall, and Makiling Residence Hall.

The application for these UPLB dormitories is done online via the Office of Student Affairs Management (OSAM) System. The OSAM System was developed to streamline the services of the OVCSA. They believe that one of the benefits of information technology that we can take advantage of is promoting the academic growth of students and their personal development (*What is OSAM?*, n.d.). On the student-side application, the requirements for applying to one of these dormitories are simply choosing the dormitory of your choice, uploading a compressed file of the needed documents, and uploading proof of payment for your reservation. The OSAM system does not cover the management system of each dormitory, relying instead on the traditional way of handling dormers' data.

Statement of the Problem

Some procedures and processes of the current management system of the UPLB dormitories, such as collecting, storing, and retrieving dormers' information, are still done manually. It takes more time and effort to gather and fetch data because of this traditional method. The need for a dormitory management information system will significantly alleviate the current process of managing UPLB dormers' information.

This study seeks to answer the following research questions:

1. What is the design and approach of the web application that can aid the stakeholders in managing the dormers' data?
2. What technologies will be used in developing the application? And
3. How can the effectiveness of this application be ensured?

Significance of the Study

M. Peng and Xie (2015) claimed that a dormitory management information system is significant in improving the work efficiency of dormitory management. Consequently, a fast and reliable query system can satisfy the stakeholders involved. A dormitory management information system can also help dorm managers and assistants in immediately fetching and understanding dormers' information and concerns.

This web application aims to digitize and better manage the data of UPLB dormers. Dormers can create and update their profile on the web application in the comfort of their homes. They will also be able to generate their monthly Statement of Account (SOA). They no longer have to be present in their respective dormitory to do so. This medium for data collection also saves more time and effort for both residents and management.

Since one of the main objectives of this study is to digitize data, dorm managers and assistants can query more efficiently. The application can aid them in searching for data

faster than a manual search on a stack of information sheets. This will enable them to cope with the demands of their work and ease some of the challenging parts of their management tasks. The study will also contribute to future-proofing dormitory management in UPLB.

Objectives of the Study

The general objective of this study is to develop a dormitory management information system for UPLB dormitories under OSH-OVCSA. Specifically, the application aims to:

1. digitize dormers' information by developing the dormer- side of the web application that allows dormers to create and update their profile;
2. allow dormers to compute and generate their SOA;
3. allow dormers to submit payment receipts;
4. aid dorm managers, attendants, and assistants in handling residents' basic information by developing the management-side of the web application;
5. assess the effectiveness and usability of the web application using the System Usability Scale (SUS).

Scope and Limitation of the Study

The focal point of this study is the development of a web application for the dormitory management information system of UPLB dormitories under OSH-OVCSA. The application will be for desktop use. The implementation of this web application focuses on digitizing dormers' information and allowing dormers to create and update their profile, generate their SOA, and submit proof of payments. Dormitory managers and assistants can optimize the query process of dormers' data without relying on traditional processes.

This study did not cover other dormitory processes such as managing and monitoring

the dormitory fees of all residents. This is because upon consultation with the dormitory personnel, each dormitory has their own process in monitoring the payment of dormers (Evangelista & RECOMMIT-OVCSA, 2024). The application will then cover only the general approaches of all UPLB dormitories.

Date and Place of the Study

The study was conducted during the 2nd semester of the academic year 2023-2024 at the Institute of Computer Science, University of the Philippines Los Baños.

REVIEW OF LITERATURE

Several studies on dormitory management information systems have been conducted because of their trend, importance, and relevance during the digital age. Consequently, the research, development, and implementation of dormitory management information systems have increased because of the aforementioned reasons. This review will focus on the importance of digitizing data, the effectiveness of information technology in management, and the incorporation of information technology in dormitory management.

The digital age introduced a more advanced way of accessing and processing information across institutions, businesses, and organizations. Emerging technologies minimized paper-driven management of data because of the power of computers. With the computer's ability to store and retrieve data more efficiently than traditional methods, it has become a preferred way of managing multiple functions of an organization (Bhakti, Hamdani, Deni, & Sugiarti, n.d.). The study Azim, Yatin, Jensonray, and Ayub@Mansor (2018) supports this claim by indicating that digitizing data is significant, especially in the 21st century, because users find utilizing online platforms to search for information easier than looking for physical records. According to Khan, Khan, and Aftab (2015), digitization supplies users immediately with the information that they need because these technologies minimize the challenges in accessing information. With this, users, especially those who grew up with technological advancement, are bound to rely more on digital platforms. Consequently, the use of paper for select transactions and activities is minimized.

Before the trend of paperless offices, establishments had to allocate spaces for printed and/or hand-written files. Most of the time, it requires an additional shelf or drawer to keep them. Although these documents are arranged and organized for the benefit of the workers, it cannot be denied that sometimes it can be a lengthy process to look for the needed information. Bhakti et al. (n.d.) emphasized that technology can narrow the space required for papers, further arguing that technology simplifies work because it can handle

data more accurately. From this, digitizing data can be seen as significant and relevant in today's world, especially in managing businesses, organizations, or other institutions.

Furthermore, efficient and effective methods of handling information or data are needed if an organization's goal is to provide a better service for its constituents. To ensure success, they must consider improving their current system, usually traditional or manual, to be competitive enough and answer the demands of their time. Technological advancement, which involves the digitization of data, can further information management within groups. As supported by Berisha-Shaqiri (2015), information technology is considered to be an important factor in a business's success as it can enhance the processes involved in making decisions and cooperating within the group. Hence, the rise of management information systems.

Management information systems are "computerized information processing systems designed to support corporate or organizational management activities" (El-Ebiary et al., 2023). Today, organizations may find it hard to keep up with the influx of data if they maintain the traditional way of handling information rather than incorporating management information systems. Berisha-Shaqiri (2015) points out that manual information systems have become more trivial. This indicates that management information systems are not only a trend in today's time but are also what's needed if the management wants to provide better services for their customers or work better with their constituents. A study conducted by Calucin, Hapa, and Benito (2018) proved the importance of switching from pen-and-paper management to a web-based management and inventory system for the St. Paul University Quezon City clinic where the system garnered an overall mean of 3.87, which interprets to Very Good, using the questionnaire from ISO 25000 for software quality. Furthermore, Hernandez (2021) conducted a study on the development of a research management information system for Quirino State University which provided the university with a computerized system that monitors research data and helps researchers make decisions easier. Local management information systems like these prove that institutions and

establishments in third-world countries, such as the Philippines, are slowly embracing a better choice for handling and managing information in their workspace. Moreover, another example of an establishment that needs to incorporate management information systems is dormitories.

According to Kai (2020), managing dormers' information manually can be inefficient which is why it is now better to use information technology. Z. Peng, Liu, and Mai (2020) further support this stand by claiming that a dormitory management information system is efficient and convenient for both students and staff. The traditional way of managing the residents' information usually takes more time and effort, especially for dorm managers and assistants. Developing countries tend to have the traditional processes in dormitories, which detriments their resource usage and efficiency, especially because the number of dorm boarders also increased in the past years (Parvathi, Sahana, Sai, Tejaswini, & Shetty, 2022). This is why the use of a dormitory management information system can help dormitory managers easily access student data and concerns by improving the efficiency of dormitory management (Jafrudin & Putra, 2020; M. Peng & Xie, 2015). However, it is also important to consider the needs of its users.

El-Ebiary et al. (2023) reported that some management information systems failed to fulfill the needs of their users because of some factors such as substandard requirement design and lack of training for its users. Considering these factors, the rise of modular interface design can be considered. A modular interface design is an interface design that breaks down a design into smaller independent parts (called modules) that will be joined together to form the system (Ramalhete, 2017). These independent parts aid users in easily finding the information that they want because of their modularity. In a study by Geng and Liu (2020), since we are living in the Internet era, applying modular interface design in dormitory management information systems has become a trend that can help users interact with the application without excessive training as it relieves users from visual pressure, helping them acquire information better. This design is beneficial not only for users who

are comfortable exploring new applications but especially for dormitory managers who may find it hard to adjust to technological advancements.

Moreover, another point of concern is where to host a dormitory management information system. R, K., and Damarjati (2021) claimed that a web application has a high level of compatibility with a dormitory management information system because it can be accessible using personal computers and smartphones without the need to install an application and create multiple versions of it for different operating systems. With a web-based dormitory management information system, students and administrators alike can access it anywhere. The use of a web application is beneficial not only for its users but also for developers.

Yang and Chen (2022) claimed that the technology in management systems is maturing, which will solidify the development of dormitory management systems in the future. The aforementioned reviews highlight the importance of having a web-based application for UPLB dormitories in improving its current management system. Dormitory management information systems are not only becoming a trend but also a necessity as institutions pave the way for future-proofing their management.

METHODOLOGY

Development Tools

UPLB DMIS was developed using a Windows 11 64-bit laptop with an AMD Ryzen 5 3500U processor and 8GB DDR4 memory. The software development tools include Visual Studio Code for the source-code editor, Render for backend deployment, Netlify for frontend deployment, and GitHub for version control. The technology stack includes MongoDB Atlas for the open-source NoSQL database management program hosted in the cloud, Express.js as the NodeJS application framework for handling the backend of the web application, React as the JavaScript library for building the application's user interface, and NodeJS was the cross-platform JavaScript runtime environment that served as the framework of the web application. Google Identity Services was also used as the JavaScript library for authenticating and authorizing Google accounts for the application, and Supabase was used as a third-party online hosting service to handle, store, and retrieve images and files uploaded on the web application.

Database Design

The database design consists of seven entities: dormitory, dorm manager, attendant, student, payment, violation, and receipt. Each entity has a unique ID. The attributes associated with the student are the content of the basic information sheet that all UPLB dormers are required to fill out. The entity-relationship diagram is shown in Fig. 1.

The *dorm manager* creates an account and registers their *dormitory* in the system. This is essential for the content of the dormitory information.

If a dormitory has an *attendant*, they may also create an account to have access privileges and for their information to be added to the dorm information. This access will

allow them to aid the dorm manager in management tasks.

Dormitories accommodate *students*. They can be classified as a resident or as an assistant. They may only be considered an assistant if they are hired by the manager. Assistants have an elevated access to the system so they can aid in management tasks. Students who belong to UPLB dormitories are required to fill out the basic information sheet. This will serve as their profile which can be viewed and manipulated by the management.

Receipts are submitted by the students. They must upload a PDF file of the receipt and input additional information such as date posted, academic year, semester, and months covered. The student can edit and delete the receipts. The management can only view the submissions.

If a student acquires a *violation*, attendants and managers have the privilege to add its record to the student's profile. It must contain the date, time, nature of the violation, and remarks. Violations may be edited and deleted by the management and can only be viewed by the student.

Managers, attendants, and assistants are also allowed to add the confirmed *payments* of the students. These confirmed payments contain the term, period covered, OR number, fees, and date paid. It can be viewed by the student and can only be edited and deleted by the management.

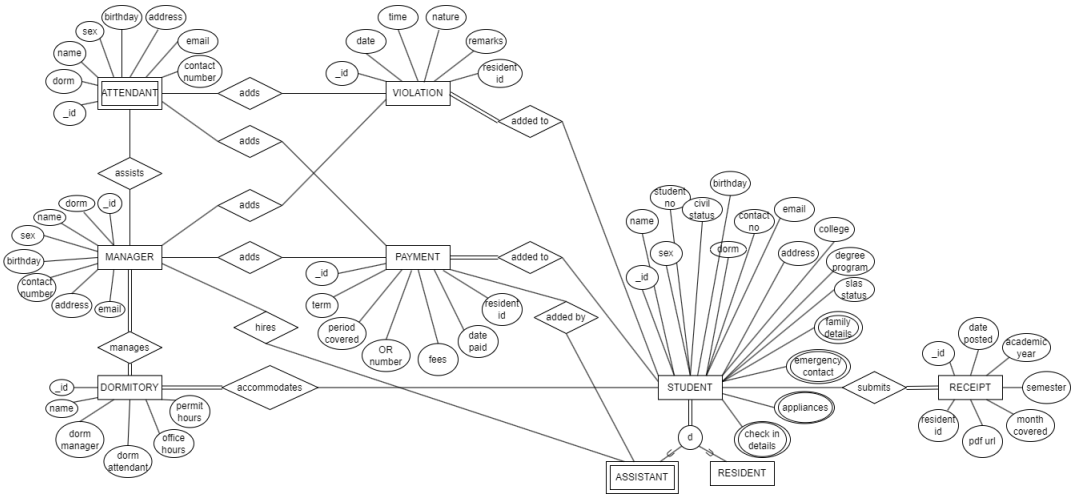

Figure 1. Entity-Relationship Diagram for UPLB DMIS

Application Testing and Participants

The web application was tested using the System Usability Scale (SUS). The survey was administered using Google Forms with the 10 standard SUS questions accompanied with a Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). An additional feedback or comment section was also provided for qualitative assessment. The list of questions can be found on Table 1.

Participants were invited from diverse UPLB dormitories. The constituents selected to participate were dorm heads or managers, attendants, assistants, and residents. Permission to invite willing participants to test the application across UPLB dormitories was gained from OSH.

Table 1. System Usability Scale

1	I think that I would like to use this system frequently.
2	I found the system unnecessarily complex.
3	I thought the system was easy to use.
4	I think that I would need the support of a technical person to be able to use this system.
5	I found the various functions in this system were well integrated.
6	I thought there was too much inconsistency in this system.
7	I would imagine that most people would learn to use this system very quickly.
8	I found the system very cumbersome to use.
9	I felt very confident using the system.
10	I needed to learn a lot of things before I could get going with this system.

RESULTS AND DISCUSSION

Features and Types of Users

This section discusses the features of the web application and is divided into four parts for each type of user: dorm heads or managers, dorm attendants, dorm assistants, and residents.

1. Dorm Heads or Managers

This section provides the list of features accessible to dorm heads or managers.

- *Log In*

  Dorm heads or managers can log in using their Google account.

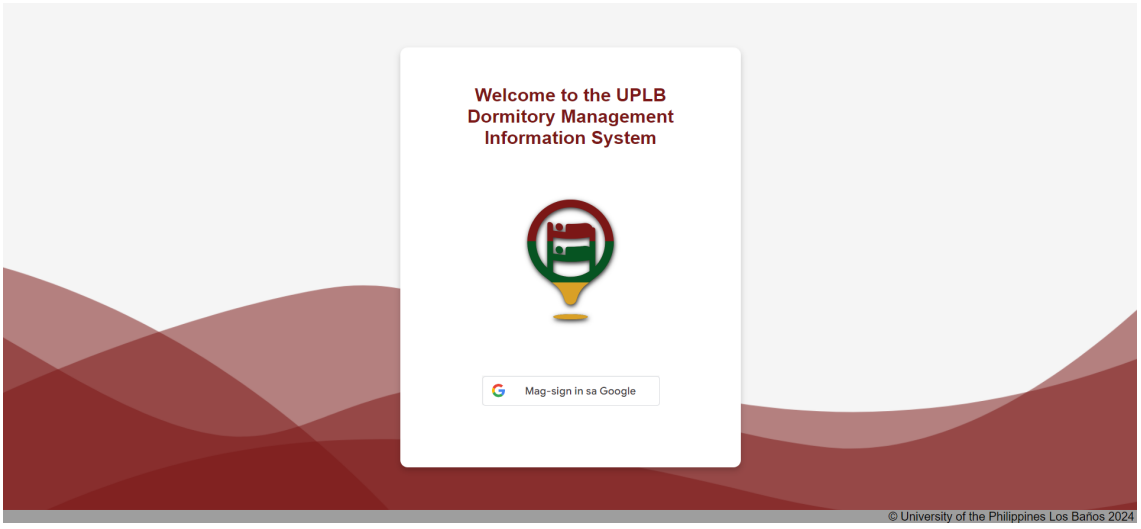

Figure 2. Landing Page

- *Register Role and Dorm*

  Dorm heads or managers can register their role and dorm where they belong. A setup prompt will appear once role and dorm are registered.

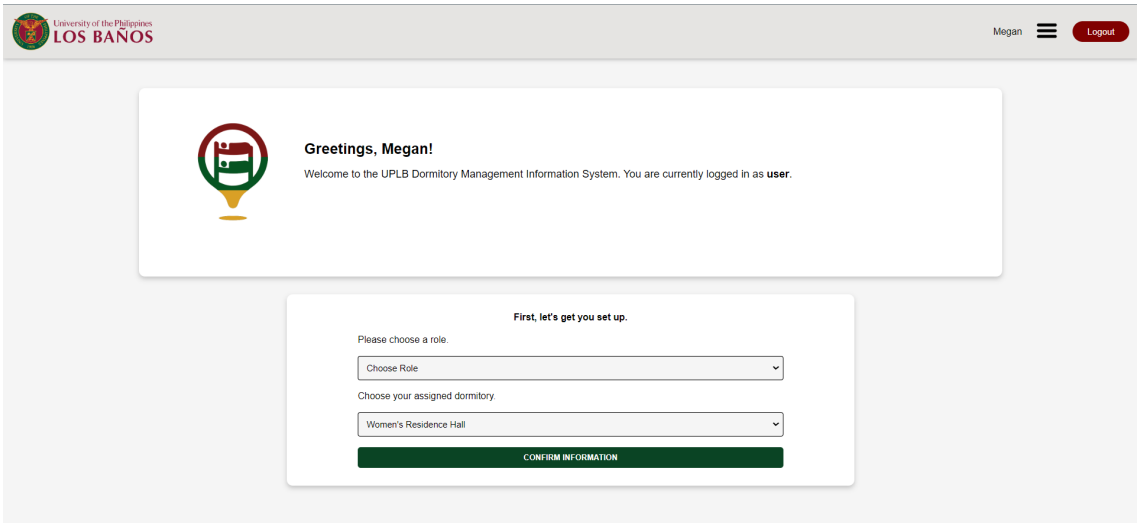

Figure 3. Register Role and Dorm Page

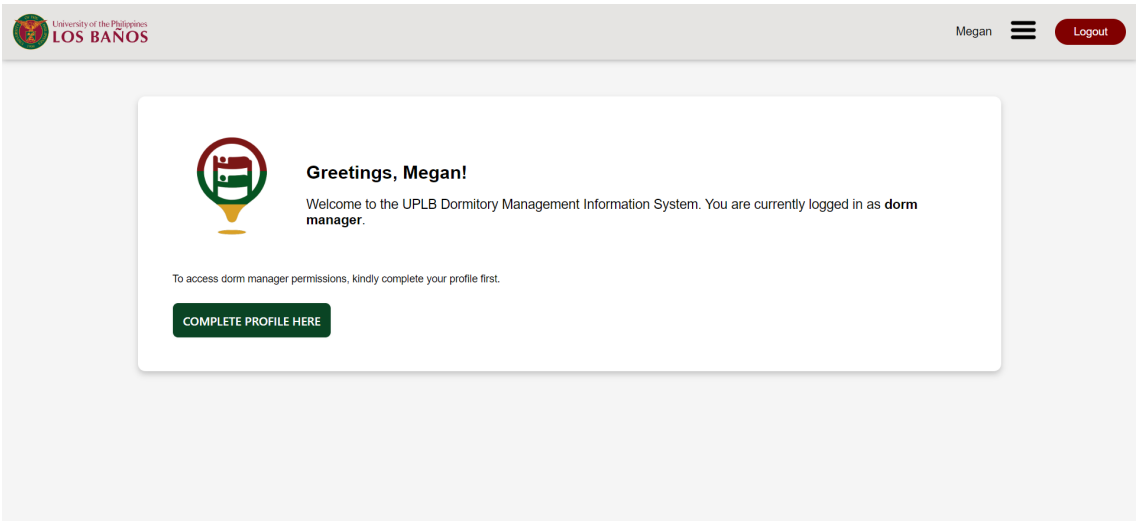

Figure 4. Setup Profile Prompt

- *Complete, View, and Update Profile*

  Dorm managers can complete, view, and update their own profiles.

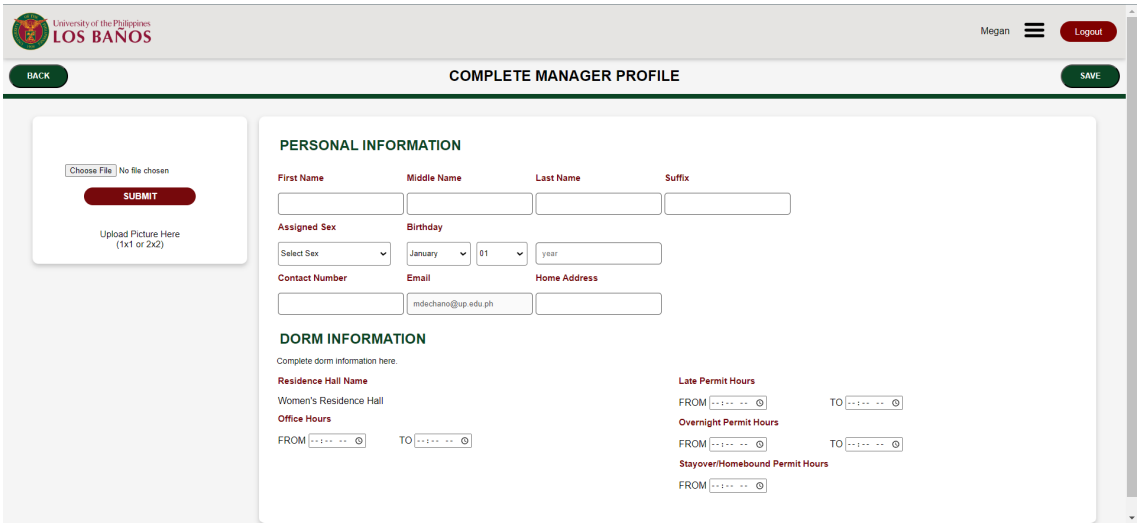

Figure 5. Complete Manager Profile

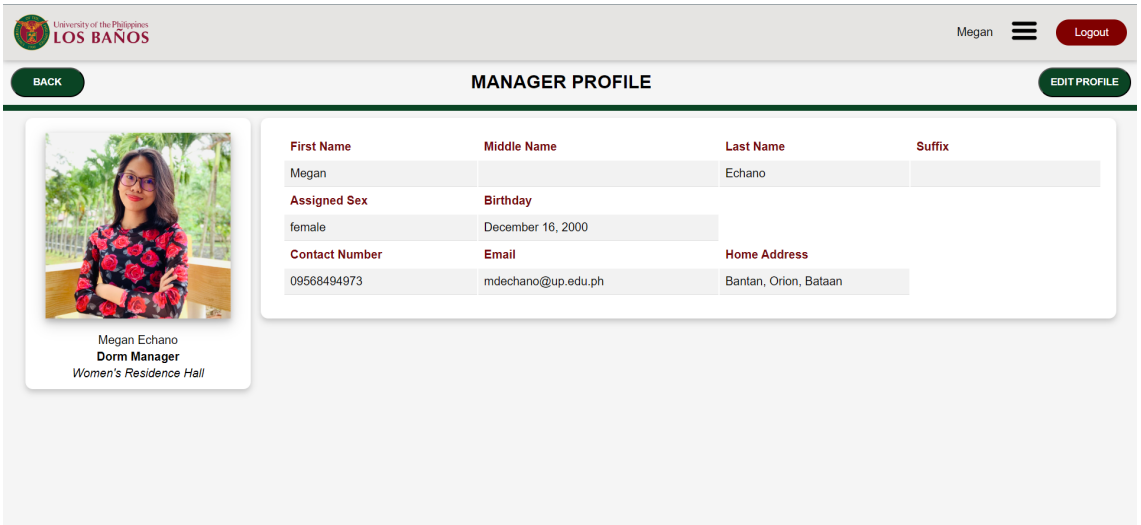

Figure 6. View Manager Profile

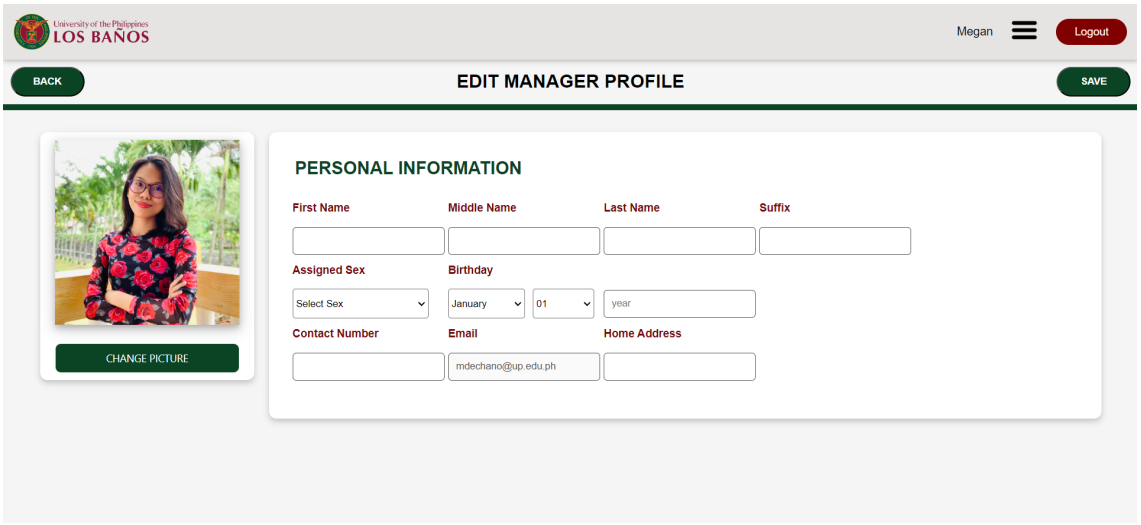

Figure 7. Edit Manager Profile

- *Create, View, and Update Dorm Information*

  Dorm heads or managers can register and update the information of their respective dormitories.

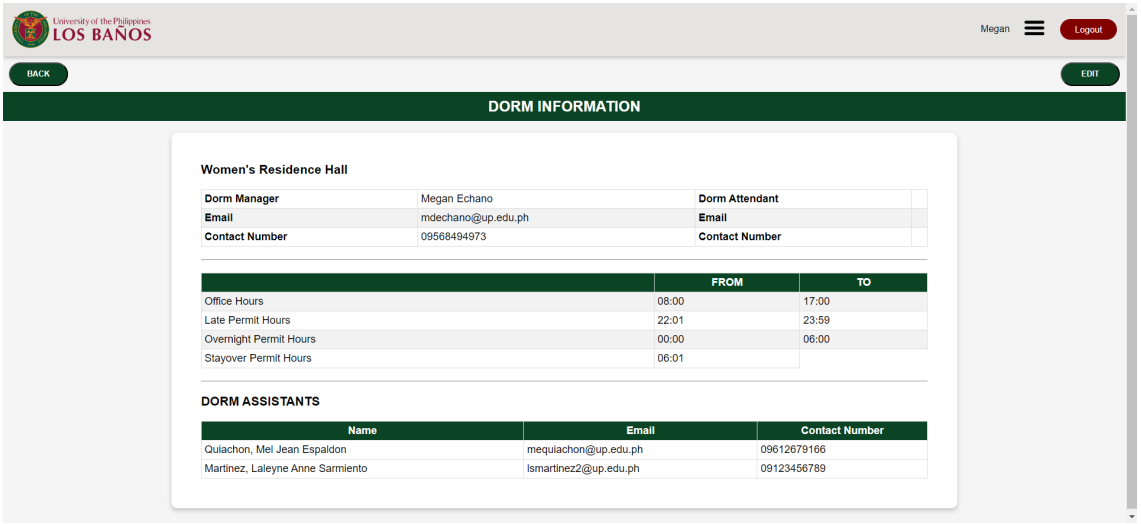

Figure 8. View Dorm Information

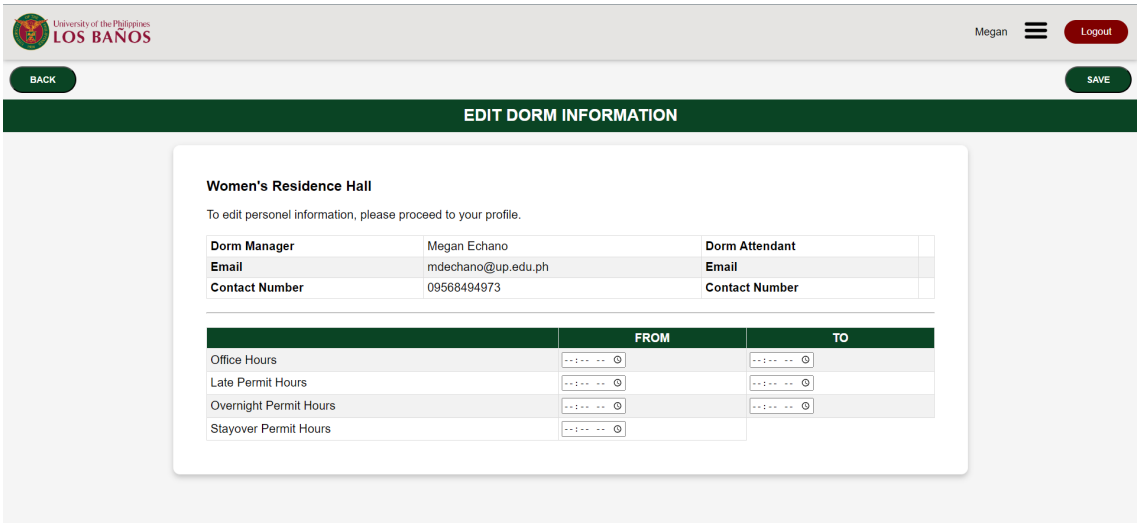

Figure 9. Edit Dorm Information

- *View List of Residents*

  Dorm heads or managers can view the residents currently residing in their dormitories in the residents list page.

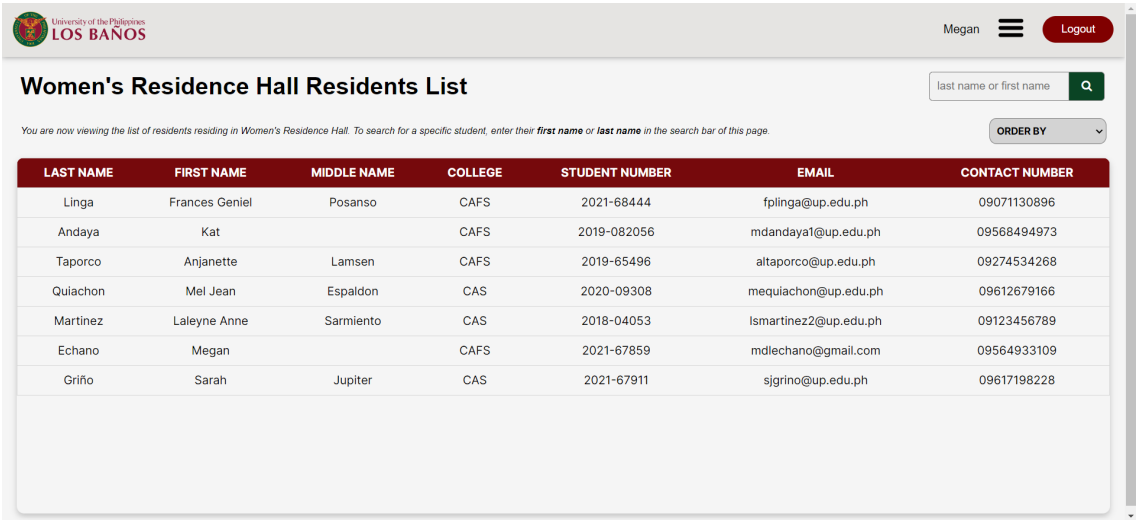

Figure 10. View, Sort, and Search for Resident in Residents List

- *Sort and Search Residents*

  Dorm heads or managers can sort the residents list according to last name, student number, or college. They can also be searched using the first or last

name of the resident.

- *View Resident Profile*

  Dorm heads or managers can view a resident's profile which contains their basic information, check in details, appliances installed, record of payments, record of violations, and emergency contact information. They will also be able to view the uploaded proofs of payment of each resident.

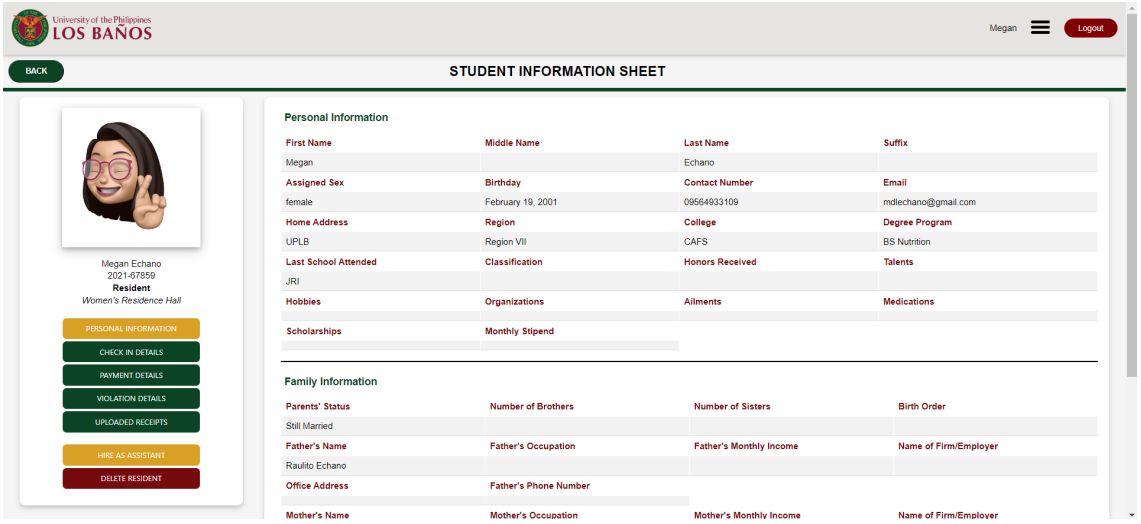

Figure 11. View Resident Information Sheet

- *Add, Edit, and Delete Payment Details*

  Dorm heads or managers can add a resident's confirmed payment to their profile. They can also view, edit, and delete the payment details.

- *Update SLAS Status of Resident*

  Dorm heads or managers can update the SLAS status of residents to be applied in their statement of accounts.

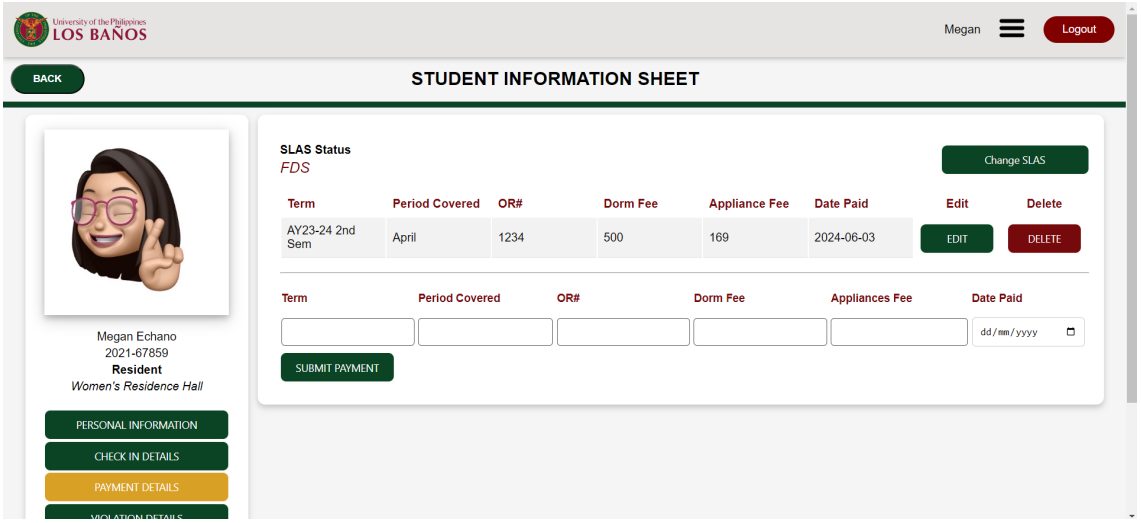

Figure 12. Add and View Payment Details

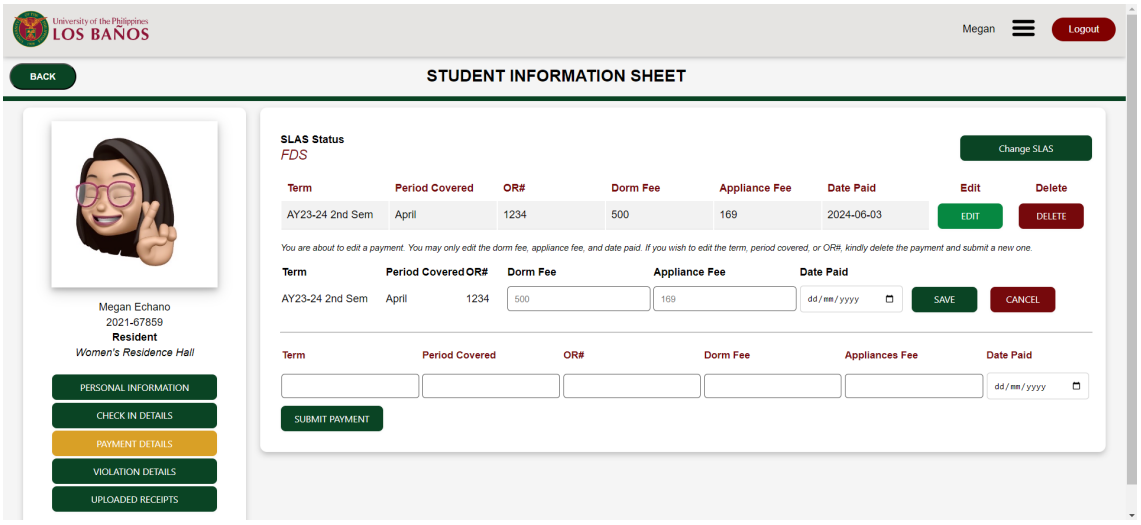

Figure 13. Edit Payment Details and Update Resident SLAS Status

- *Add, Edit, and Delete Violations*

  Dorm heads or managers can add a resident's violation to their profile. They can also view, edit, and delete the violations.

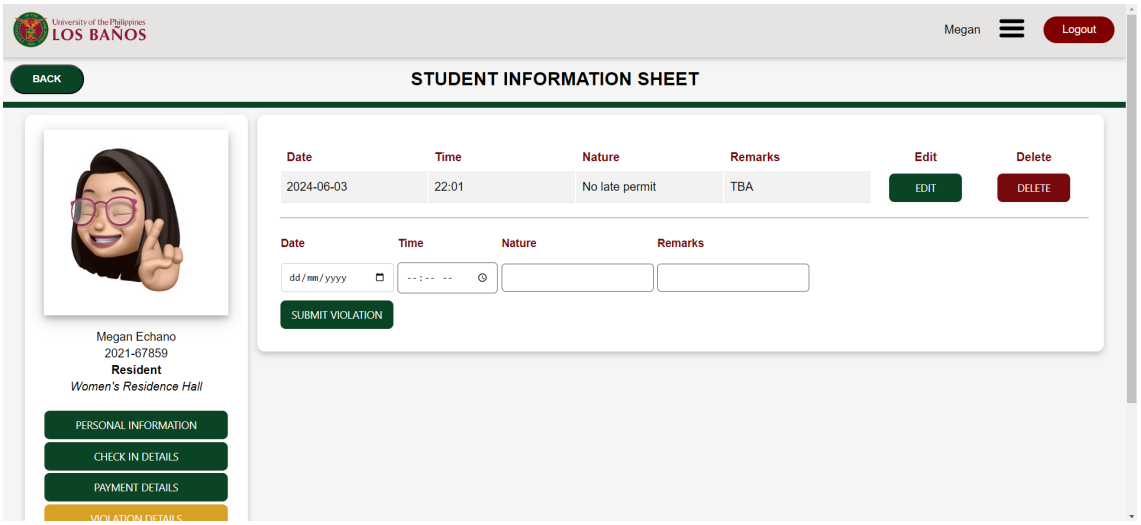

Figure 14. View Violation Details

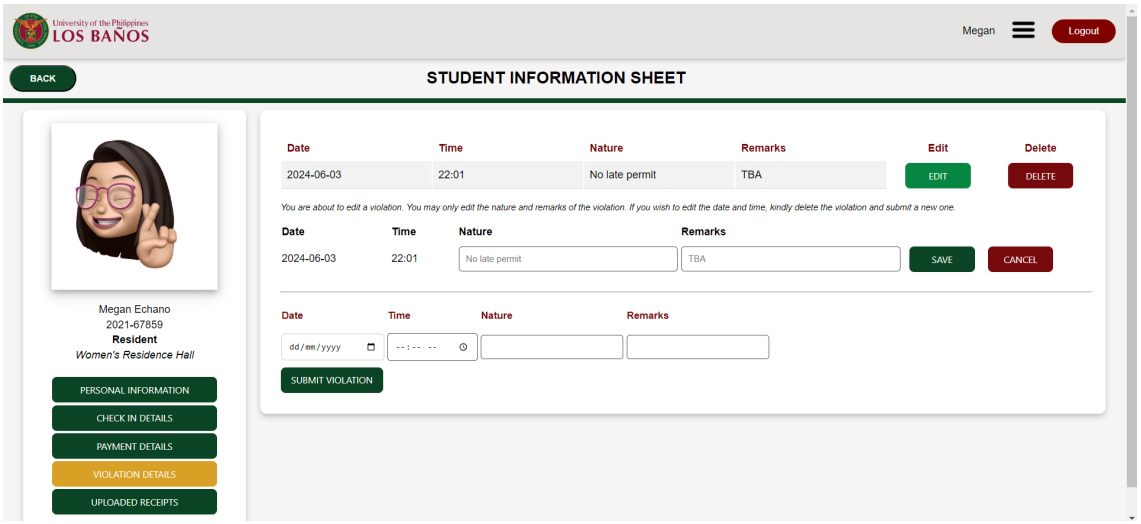

Figure 15. Edit Violation Details

- *Hire and Dismiss Dorm Assistants*

  Dorm heads or managers can update a resident's role if they will be hired as dorm assistants.

- *Delete Resident*

  Dorm heads or managers can delete resident accounts of those no longer residing in their respective dormitories.

2. Dorm Attendants

   This section provides the list of features accessible to dorm attendants. All features are similar to the access allowed for dorm heads or managers. Additionally, dorm attendants do not have the privilege to hire or dismiss dorm assistants and delete residents.

   - *Log In*

     Dorm attendants can log in using their Google account.

   - *Register Role and Dorm*

     Dorm attendants can register their role and dorm where they belong.

   - *Complete, View, and Update Profile*

     Dorm attendants can complete, view, and update their own profiles.

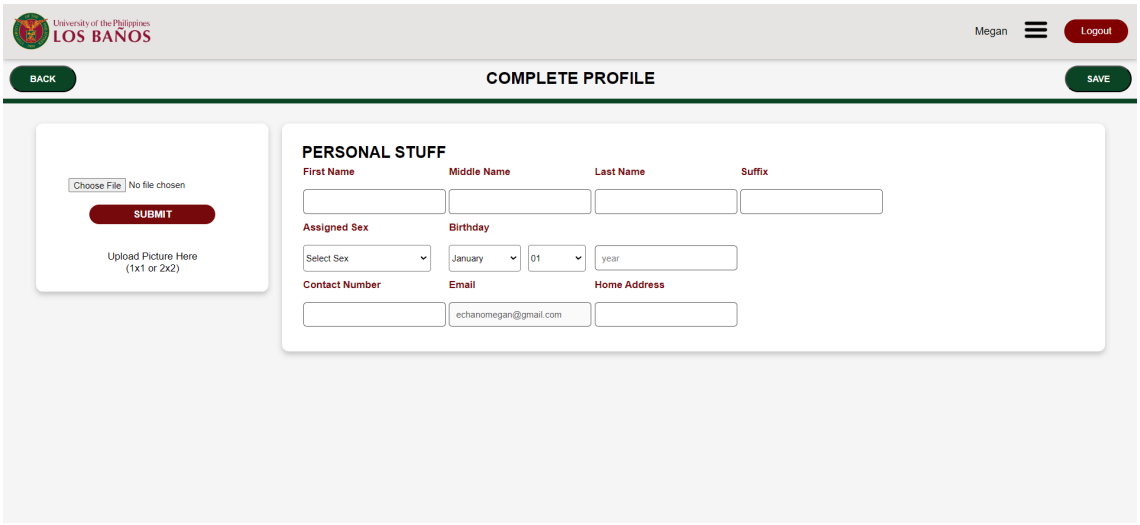

Figure 16. Dorm Attendant Complete Profile

- *View and Update Dorm Information*

  Dorm attendants can view and update the information of their respective dormitories.

- *View List of Residents*

  Dorm attendants can view the residents currently residing in their dormitories in the residents list page.

- *Sort and Search Residents*

  Dorm attendants can sort the residents list according to last name, student number, or college. They can also be searched using the first or last name of the resident.

- *View Resident Profile*

  Dorm attendants can view a resident's profile which contains their basic information, check in details, appliances installed, record of payments, record of violations, and emergency contact information. They will also be able to view the uploaded proofs of payment of each resident. They will not have access to hiring or deleting residents.

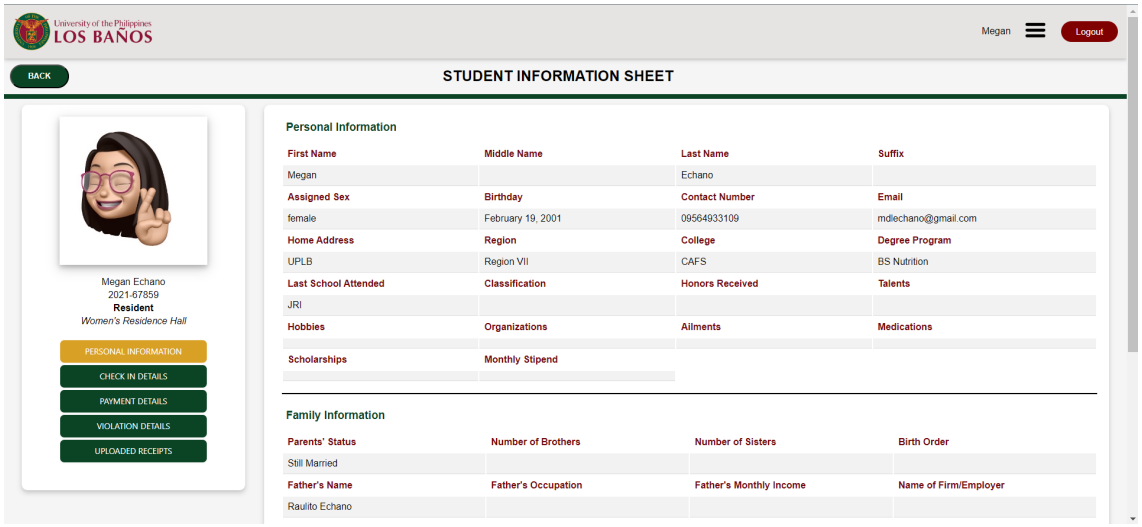

Figure 17. View Student Info Sheet for Attendants and Assistants

- *Add, Edit, and Delete Payment Details*

  Dorm attendants can add a resident's confirmed payment to their profile. They can also view, edit, and delete the payment details.

- *Add, Edit, and Delete Violations*

  Dorm attendants can add a resident's violation to their profile. They can also view, edit, and delete the violations.

- *Update SLAS Status of Resident*

  Dorm attendants can update the SLAS status of residents to be applied in their statement of accounts.

3. Dorm Assistants

This section provides the list of features accessible to dorm assistants. All features are similar to the access allowed for dorm attendants. However, dorm assistants do not have the privilege to add, edit, and delete resident violations.

- *Log In*

  Dorm assistants can log in using their Google account.

- *Register Role and Dorm*

  Dorm assistants can register their role and dorm where they belong.

- *Complete, View, and Update Profile*

  Dorm assistants can complete, view, and update their own profiles.

- *Generate Statement of Account*

  Dorm assistants are considered residents and can still generate their statement of account.

- *Add, Edit, and Delete Payment Receipts*

  Dorm assistants are considered residents and can still add, view, edit, and delete their payment receipts.

- *View Dorm Information*

  Dorm assistants can view the dorm information of their dormitory.

- *View List of Residents*

  Dorm assistants can view the residents currently residing in their dormitories in the residents list page.

- *Sort and Search Residents*

  Dorm assistants can sort the residents list according to last name, student number, or college. They can also be searched using the first or last name of the resident.

- *View Resident Profile*

  Dorm assistants can view a resident's profile which contains their basic information, check in details, appliances installed, record of payments, record of violations, and emergency contact information. They will also be able to view the uploaded proofs of payment of each resident.

- *Add, Edit, and Delete Payment Details*

  Dorm assistants can add a resident's confirmed payment to their profile. They can also view, edit, and delete the payment details.

4. Residents

- *Log In*

  Residents can log in using their Google account.

- *Register Role and Dorm*

  Residents can register their role and dorm where they belong.

- *Complete, View, and Update Profile*

  Residents can complete, view, and update their own profiles.

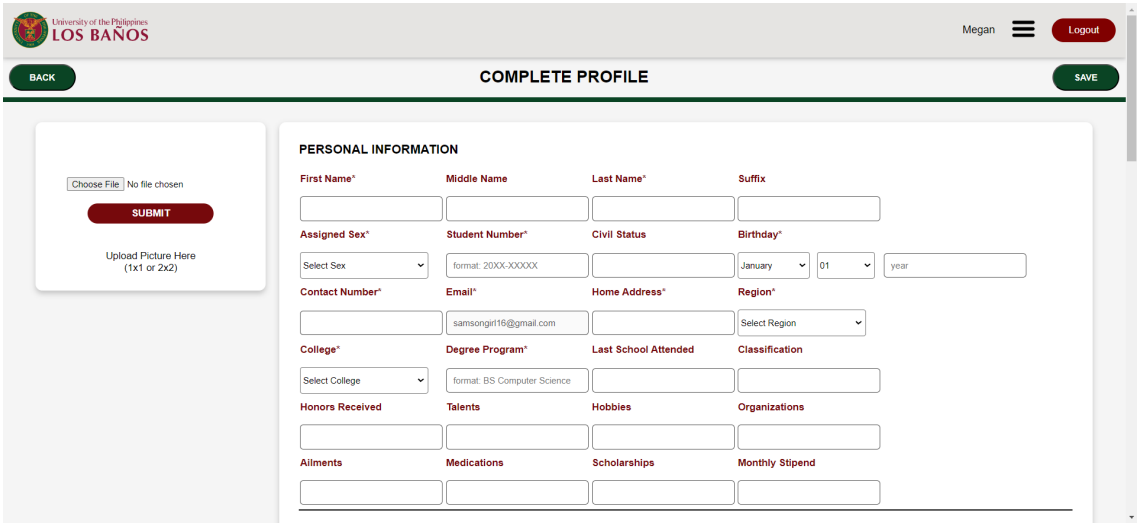

Figure 18. Complete Profile for Residents

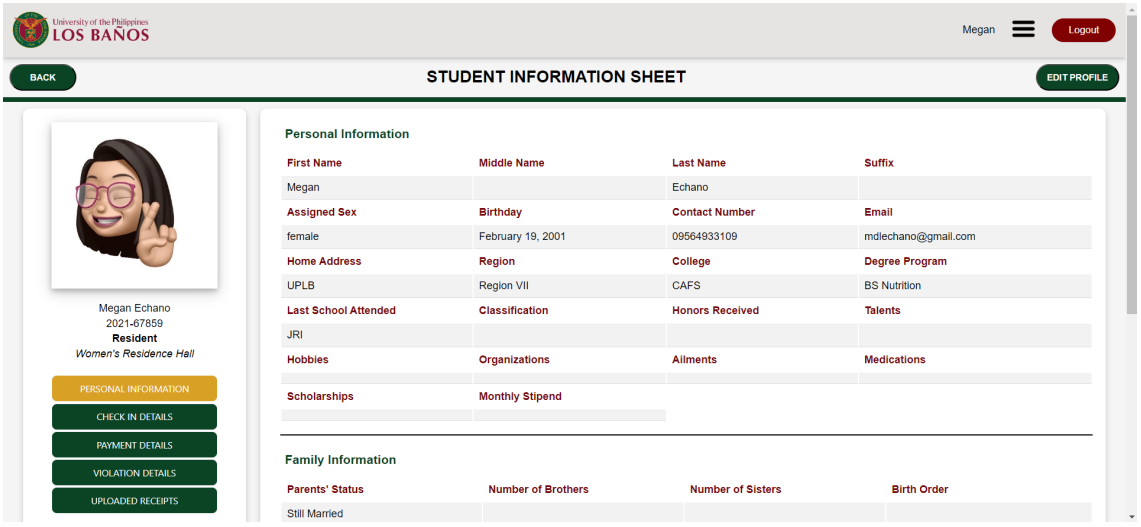

Figure 19. View Own Profile for Residents

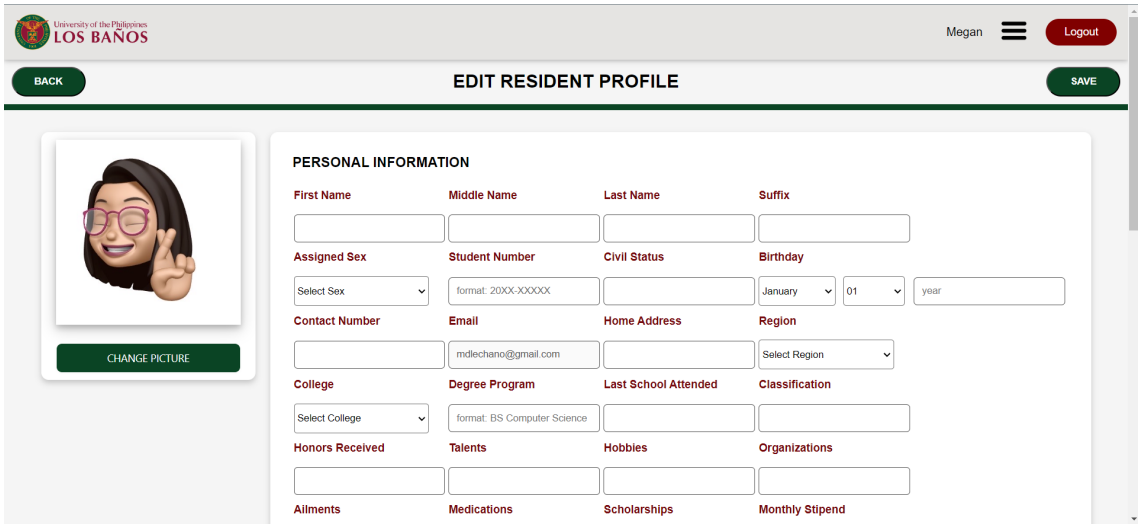

Figure 20. Edit Profile for Residents

- *Generate Statement of Account*

  Residents can generate their statement of account.

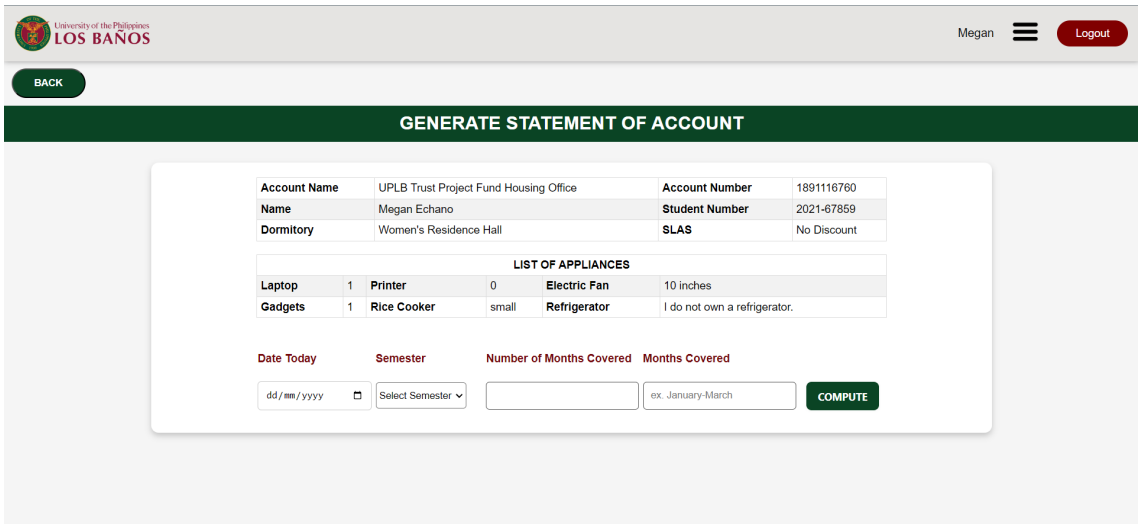

Figure 21. Generate Statement of Account

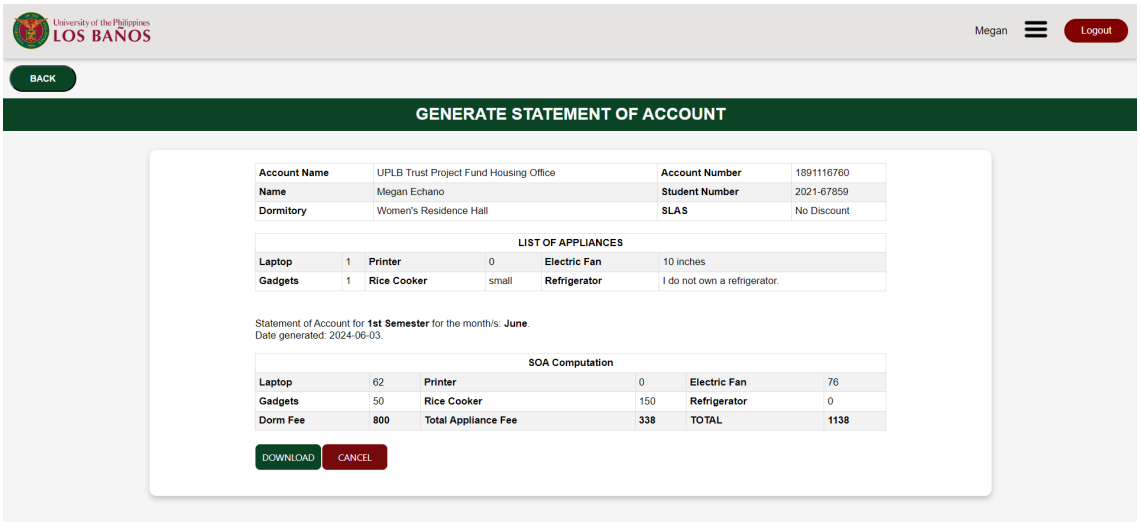

Figure 22. Compute and Download Statement of Account

- *Add, Edit, and Delete Payment Receipts*

  Residents are considered residents and can still add, view, edit, and delete their payment receipts.

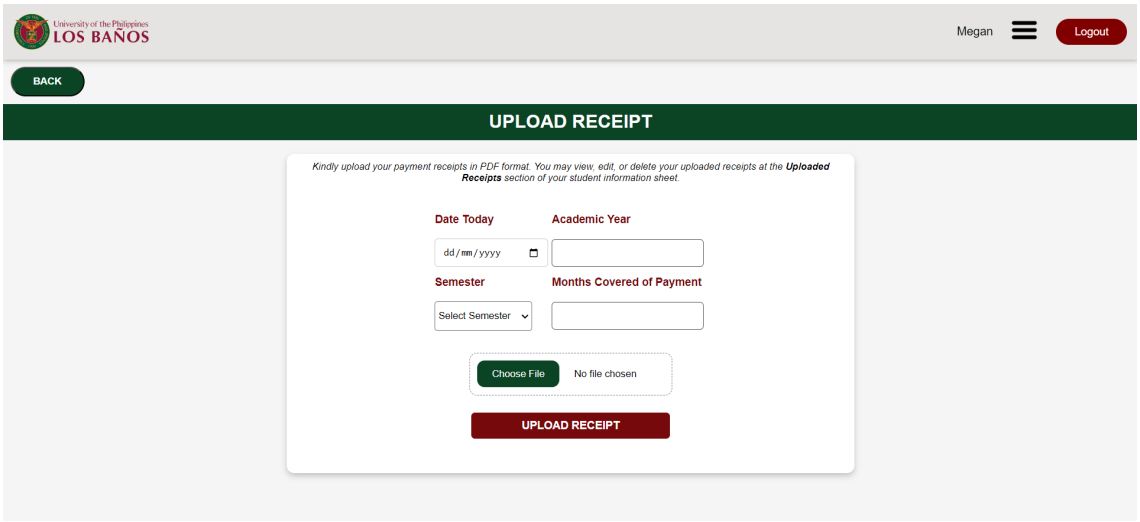

Figure 23. Upload Payment Receipts

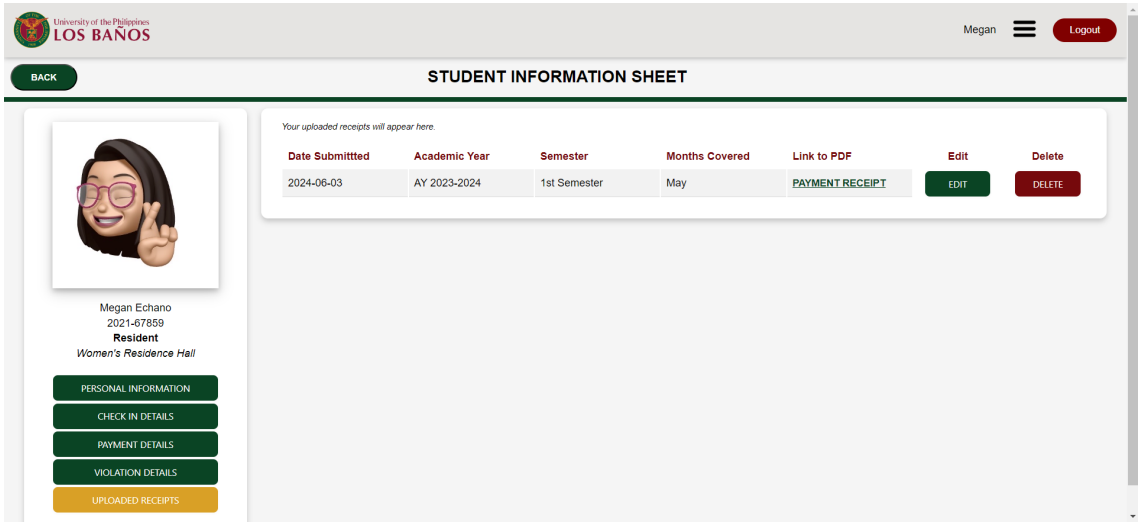

Figure 24. View Uploaded Payment Receipts

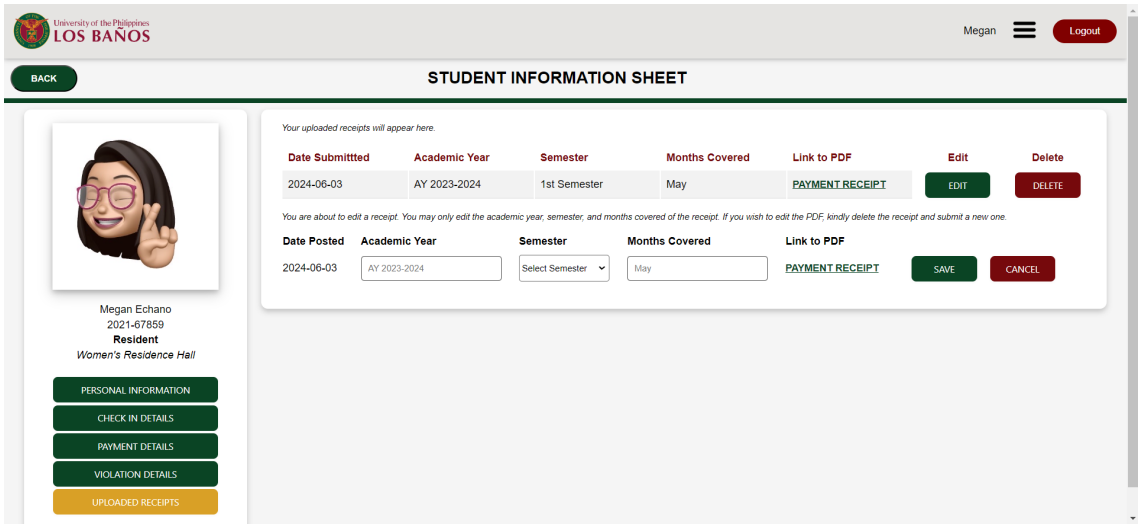

Figure 25. Edit Payment Receipts

- *View Dorm Information*

  Residents can view the dorm information of their dormitory.

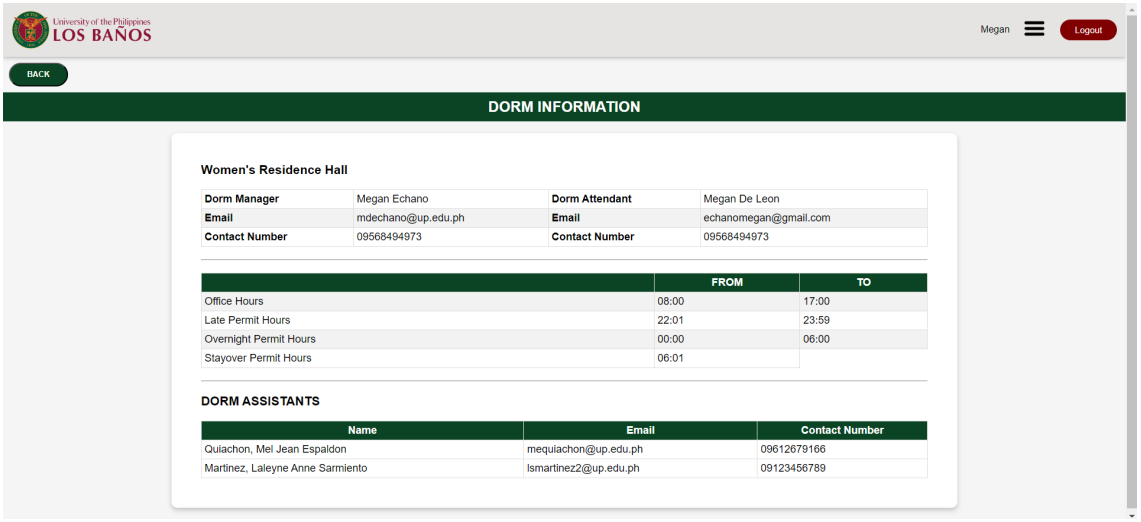

Figure 26. View Dorm Information

Resident-side Application

Residents must sign in using their Google account. If it is their first time accessing the system, they will be added to the list of users and will be prompted to set up their role and dormitory upon sign in. Before they are able to access application features for residents, they must first complete their profile. Application features are disabled until they have successfully registered their basic information.

After successful login and completion of profile, they will be able to access the application features for residents, namely: viewing of student information sheet, editing of student information sheet, viewing dorm information, viewing manager and attendant's profile, computing and generating statement of account, and uploading, viewing, editing, and deleting payment receipts.

Residents can view their record of confirmed payments and record of violations but cannot edit or delete the respective entities.

Management-side Application

The management-side of the web application comprise of the following users: dorm heads or managers, attendants, and assistants. All users in the management-side are required to sign in using their Google account. Similar to residents, if it is their first time accessing the system, they will be prompted to set up their role and dorm. They must also complete their profile before they can access their role's application features.

The dorm heads or managers have the highest level of access in the system. Significantly, the actions that only dorm managers can do are the following: set up the dorm information, hire and dismiss dorm assistants, and delete residents.

All users under the management category should be able to view and edit their own profile, view the residents list, sort the residents list, search for a resident using their first or last name, access the profile of a resident, and add, view, edit, and delete the confirmed payment receipt of a resident.

Significantly, some of the features that only the dorm manager and attendant can do are the following: add, view, edit, and delete a resident's violation, update a resident's SLAS status, and edit dorm information.

Additionally, dorm assistants are still residents of their respective dormitories. This means that they also have access to features such as generating statement of account and uploading their payment receipt.

Testing and Evaluation

With permission from OSH, some participants were visited face-to-face in their respective dormitories while some who were unavailable for face-to-face testing and evaluation were sent a message of request for participation.

Respondents were encouraged to test the web application given a list of features for their user category. Some participants, particularly dorm managers, who are in need of

technological assistance were guided through the testing.

There was a total of 23 participants and the distribution are as follows: five dorm managers, four dorm assistants, one dorm attendant, and 13 residents. A representation of these figures are shown in Fig. 27 below.

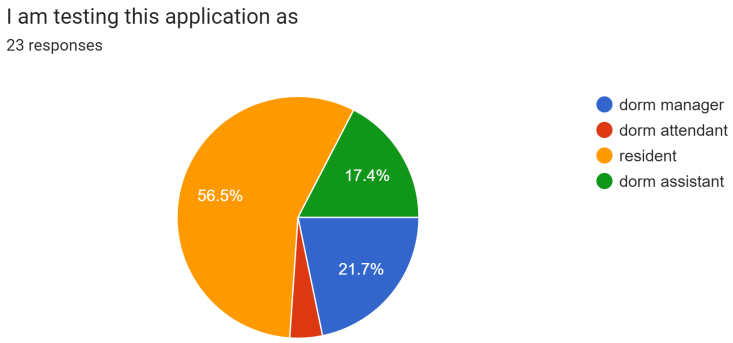

Figure 27. Participant Distribution

Residents across UPLB dormitories were satisfied when testing the application. This is reflected from the resident-side mean score of 84.23. The same can be said for the participants from the management-side with a mean score of 85.25. The scores are shown in Table 2 and Table 3, respectively.

The individual scores are shown in Table 4. The overall application garnered a mean score of 84.67. This score provides us with the insight that the web application has an 'A' grading and an adjective rating of 'excellent'. This also suggests that participants found the application to be user-friendly, effective, and efficient.

Table 2. Residents Scores Table

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Individual Score
1	5	1	5	1	5	1	5	1	5	1	100
2	4	2	4	1	4	2	4	2	4	1	80
3	4	1	5	1	5	2	5	1	5	1	95
6	5	2	4	3	5	2	5	1	5	3	82.5
7	4	3	4	3	4	2	4	2	4	2	70
8	4	2	4	2	4	2	4	2	4	3	72.5
9	5	1	3	2	5	1	4	2	5	4	80
10	5	1	5	1	5	2	5	1	5	1	97.5
11	5	2	5	2	4	3	4	1	4	1	82.5
18	5	2	4	2	5	1	4	1	5	2	87.5
19	5	2	4	2	4	3	4	1	5	2	80
20	5	1	5	1	5	1	5	1	5	1	100
21	5	2	4	3	4	3	3	2	4	3	67.5
Mean Score for Resident-side											**84.23076923**

Table 3. Management Scores Table

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Individual Score
4	5	2	5	1	5	3	4	2	4	2	82.5
5	5	1	5	1	5	2	4	1	5	1	95
12	5	1	5	5	5	1	3	1	4	5	72.5
13	5	2	5	5	5	1	5	1	5	4	80
14	5	1	5	1	4	1	5	1	5	1	97.5
15	5	2	3	3	4	3	4	2	5	3	70
16	5	3	4	2	4	2	5	3	5	1	80
17	5	1	5	1	5	2	4	1	5	2	92.5
22	5	1	5	1	5	1	5	1	5	1	100
23	5	1	5	4	5	1	4	1	5	4	82.5
Mean Score for Management-side											**85.25**

Table 4. Overall Scores Table

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Individual Score
1	5	1	5	1	5	1	5	1	5	1	100
2	4	2	4	1	4	2	4	2	4	1	80
3	4	1	5	1	5	2	5	1	5	1	95
4	5	2	5	1	5	3	4	2	4	2	82.5
5	5	1	5	1	5	2	4	1	5	1	95
6	5	2	4	3	5	2	5	1	5	3	82.5
7	4	3	4	3	4	2	4	2	4	2	70
8	4	2	4	2	4	2	4	2	4	3	72.5
9	5	1	3	2	5	1	4	2	5	4	80
10	5	1	5	1	5	2	5	1	5	1	97.5
11	5	2	5	2	4	3	4	1	4	1	82.5
12	5	1	5	5	5	1	3	1	4	5	72.5
13	5	2	5	5	5	1	5	1	5	4	80
14	5	1	5	1	4	1	5	1	5	1	97.5
15	5	2	3	3	4	3	4	2	5	3	70
16	5	3	4	2	4	2	5	3	5	1	80
17	5	1	5	1	5	2	4	1	5	2	92.5
18	5	2	4	2	5	1	4	1	5	2	87.5
19	5	2	4	2	4	3	4	1	5	2	80
20	5	1	5	1	5	1	5	1	5	1	100
21	5	2	4	3	4	3	3	2	4	3	67.5
22	5	1	5	1	5	1	5	1	5	1	100
23	5	1	5	4	5	1	4	1	5	4	82.5
Mean Score											**84.67391304**

Web Application Assessment

Aside from the SUS questionnaire, participants were also requested to give feedback about the web application.

Residents commented that the system was easy to use and navigate. They were particularly satisfied about the generation of statements of account and submission of payment receipts. They also suggested to add more features such as requesting of permits for activities beyond curfew hours and consideration for multiple instance of an appliance.

Management-side participants were also satisfied with the web application. They affirmed that this system, if implemented in UP dorms, could alleviate their workload. Some suggested a mobile version and desktop version in the local network for easier and a more convenient way of accessing data.

Participants also commented that there could be more improvements in the user interface and formatting of generated documents. Overall, they saw great potential in the application as it can further advance data collection, storage, and retrieval for dormitory management in UPLB.

SUMMARY AND CONCLUSION

Conclusion

Dormitories are one of the establishments that could implement management information systems to aid in the demands of its constituents' work.

UPLB student housing facilities, also known as UPLB dorms, already switched from a traditional reservation method to an online reservation via the OSAM System. However, each dormitory is still implementing the traditional basic student information sheet to collect, store, and retrieve dormers' data.

The development of UPLB DMIS aims to digitize dormers' information and allow dormers to have more convenient ways of fulfilling some of their dorm responsibilities. The web application was able to show users from the management side that an online alternative to the traditional basic information sheet is feasible and more convenient in these developing times.

The testing and evaluation of the web application was held online and face-to-face. A total of 23 participants willingly tested and evaluated the system using SUS. It garnered a mean score of 84.67. This is equivalent to an 'A' grading with an 'excellent' adjective rating.

Recommendations

It is highly recommended that the system be integrated with any UPLB-related systems that can easily validate user involvement and role in the university. This is to avoid redundancy in data and provide more opportunities for system development.

Further improvements in user interface and design should also be considered. Some participants suggested that additional university-related information and announcements

be posted in the system as well. The development of a mobile application version and desktop application version in the local network was also suggested. This is to promote more accessibility and flexibility of the system that is fit for travel, emergency purposes, and/or connectivity issues.

Another step to take is consultation with the UPLB dorm constituents to consider their needs. An initial interview with the Women's Residence Hall dorm manager was the only one conducted during the first semester of AY 2023-2024. Further knowing the needs of the constituents may result to higher satisfaction among its users.

LITERATURE CITED

AZIM, N. A. M., YATIN, S. F. M., JENSONRAY, R. C. A., & AYUB@MANSOR, S. (2018). Digitization of records and archives: Issues and concerns. *International Journal of Academic Research in Business and Social Sciences*, *8*(9), 170-178.

BERISHA-SHAQIRI, A. (2015). Management information system and competitive advantage. *Mediterranean Journal of Social Sciences*, *6*(1), 204-208.

BHAKTI, D. D., HAMDANI, N. A., DENI, I., & SUGIARTI, G. A. F. M. . I. S. (n.d.). Analysis of digitizing archive applications to reduce paper usage. In *Iop conference series: Materials science and engineering* (Vol. 1098).

CALUCIN, R. A., HAPA, J. P., & BENITO, J. P. P. (2018). A web-based clinic records management and inventory system for st. paul university quezon city. *Cognoscere: SPUQC Student Research Journal*, *13*(1), 82-90.

Dormitory. (n.d.). Retrieved from `https://dictionary.cambridge.org/us/dictionary/english/dormitory`

EL-EBIARY, Y., HATAMLEH, A., MOAIAD, Y., AMAYREH, K., MOHAMED, R., AL-HAITHAMI, W., & SAANY, S. (2023). A review of the effectiveness of management information system in decision making. *Journal of Pharmaceutical Negative Results*, *14*(2), 1281-1288.

EVANGELISTA, H. F., & RECOMMIT-OVCSA. (2024). private communication.

GENG, X., & LIU, S. (2020). Application of modular interface design in student dormitory management system. In *Proceedings of the 4th international conference on culture, education and economic development of modern society (iccese 2020)* (Vol. 416, p. 172-179). Moscow, Russia.

HERNANDEZ, D. M. P. (2021). Research management information system of quirino state university. *QSU Research Journal*, *10*(1), 78-89.

JAFRUDIN, & PUTRA, Y. (2020). Innovation development of web-based dormitory information system at boarding school sma terpadu krida nusantara. In *3rd international conference on informatics, engineering, science, and technology* (Vol. 879). Bandung, Indonesia.

KAI, Z. (2020). Design and analysis of campus dormitory management system based on java. *The Frontiers of Society, Science and Technology*, *2*(17), 1-6.

KHAN, S., KHAN, S., & AFTAB, M. (2015). Digitization and its impact on economy. *International Journal of Digital Library Services*, *5*(2), 138-149.

Management system standards. (n.d.). Retrieved from https://www.iso.org/management-system-standards.html

PARVATHI, A. K., SAHANA, S., SAI, C. L., TEJASWINI, S., & SHETTY, D. V. (2022). Dormitory world. *Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal*, *11*(2), 41-45.

PENG, M., & XIE, X. (2015, April). The design of dormitory management system for college students based on android platform. In *Proceedings of the 2015 international conference on intelligent systems research and mechatronics engineering* (Vol. 121, p. 1872-1875).

PENG, Z., LIU, T., & MAI, L. (2020). Design and implementation of dormitory management system based on ssm framework. In *2020 international conference on information science, parallel and distributed systems (ispds)* (p. 321-325). Xi'an, China.

R, K., A. A., & DAMARJATI, C. (2021). Design and build of unires student dormitory management system of umy integrated with the campus system. *Emerging Information Science and Technology*, *2*(2), 84-93.

RAMALHETE, R. (2017, January). *Does a modular design approach future-proof your concept?* Retrieved from https://uxstudioteam.com/ux-blog/modular-design/

Uplb dormitories. (n.d.). Retrieved from https://uplbosa.org/housing/dormitories

What is osam? (n.d.). Retrieved from https://uplbosa.org/page-osam

YANG, Y., & CHEN, S. (2022). Design and implementation of college dormitory management system. In *2022 fourth international conference on emerging research in electronics, computer science and technology (icerect)* (p. 1-5). Mandya, India.