Managing Customer Reservations of BulSU Hostel through the Development of Online Information and Reservation System

Mayleen Dorcas B. Castro, and Eunice B. Custodio
Bulacan State University, City of Malolos Bulacan, Philippines, 3000
Email: ehr_lyn@yahoo.com, ayencustodio408@gmail.com

Abstract—**Accurate and timely reservations are necessary to ensure proper service and positive customer experience for many service-oriented businesses. In this study, the proponents considered factors like customer satisfaction and positive experience upon the stay in a hostel which started in the reservation procedure. In order to manage customer reservations of Bulacan State University (BulSU) Hostel, the proponents design and develop an "Online Information and Reservation System for BulSU Hostel". Different functionalities were incorporated into the developed system like the creation of different user account for the staff/front desk and online customers, prices updates through online admin portal, payments thru bank account, confirmation thru email after reservation, report generation concerning income, number of customers and monthly report, counting the numbers of viewers and settings for rates, taxes and other discounts. Visual Basic .Net and ASP. Net. were used for the system front-end while Microsoft Access was used as the database application as well Crystal Report was used to display reports.**
The developed system was evaluated using the software quality standard ISO 9026 with different software criteria as follows: Functionality, Accuracy, Reliability, User-friendliness, and Security and all of them were interpreted as "Acceptable" based on the equivalent ratings presented in the Likert scale.

Index Terms—**managing customer reservations, hostel services, hostel customer services, online reservation, online information system and reservation system**

I. INTRODUCTION

Hotel reservations through web services are becoming very popular method for booking hotel rooms which is the best option today to automate and improve the booking processes.

On the part of the company, online reservation system let them accept bookings for different services online [1], which helps managing the reservation process of its customers. Reservation online enable users to determine the available rooms on a certain range of dates based on real time data from booked reservations and existing check-ins [2]. It also provides screens to create, modify, cancel, and view hotel reservations.

Reserving a room ensures or guarantees the guest about the availability of a room on arrival at the hotel, as reservation is a commitment made by the hotel, when the hotel has accepted the reservation request [3].

Prior to internet services, travelers could write, telephone the hotel directly, or use a travel agent to make a reservation. Online hotel reservations are also helpful for making last minute travel arrangements. Hotels may drop the price of a room if some rooms are still available.

In Bulacan State University (BulSU), Philippines, Hostel started in 2005 which caters the growing number of clientele who wants a comfortable and convenient place to stay while taking short-term courses in the University or attending conferences or seminars within the campus.

The BulSU hostel is a budget-oriented, shared-room accommodation that accepts individual travelers or groups for short-term stays. In some countries the word hostel can also refer to student accommodation that provides common areas and communal facilities. The University Hostel is also popular among foreign students and guests of the University. The Hostel 45 rooms as well the facilities are also made available for the interests of the students of the university. Students taking up Hotel and Restaurant Administration likewise use the facility for their on-the-job training.

II. BACKGROUND OF THE STUDY

Since hotel industry is currently one of the most promising and lucrative business, which rapidly developing and adapting to the requirements of our modern lifestyle, this is why there is a great need for quality software to improve the efficiency of receptionists staffs and managers. And delivering value for customers has become a central theme in business [4]. In the Philippines, business travel spending is expected to grow from 5.5% in 2014 and rise to 4.8% in 2024. Foreign visitors are expected to grow from 2.0% in 2014 and rise by 7.3% in 2024 [5]. Capitalizing on the opportunities for this travel & tourism growth will, of course, require destinations and regional authorities, particularly those in emerging markets, to create favorable business climates for investment like the country's hotels and hostels services which is necessary to facilitate a successful and sustainable tourism sector.

To promote its services, BulSU Hostel needs to maintain the record of guests and reserve rooms beforehand. The reservation system comes into action once a request for reservation comes to the hotel. It can be a direct query from the guest, or from a travel agent or tour operator among others sources [3]. At the same time, customers should be able to know the availability of the rooms on a particular date. They should be able to reserve the available rooms according to their needs in advance.

Therefore, a thorough knowledge and assessment of the manual process of reservations in BulSU Hostel could help develop a system to help manage the customer reservations and also to support its day-to-day transactions. Upon observing these problems in the university services, the proponents designed and developed an Online Information and Reservation System for BulSU Hostel.

A. Statement of the Problem

Presently, BulSU Hostel is using Microsoft Excel in managing records of customers and keeping records of finances and expenses. Hostel staffs find it tedious in keeping records and preparing reports of the customer's reservation. Even with the availability of many Reservation System software which can be outsourced, the proponents proposed an online reservation which will be suitable to the needs of the BulSU Hostel and be able manage its customer's reservations efficiently.

The proponents believed that through the development of Online Information and Reservation system for Bulacan State University Hostel, even foreign students who wanted to study in the University can inquire and have their reservation online. This is one of the concerns of BulSU Hostel, to make the room reservation online unlike the present practice where only the walk-in customers can reserve and make transaction in the Hostel.

Feedbacks from the end-user in the testing and evaluation stage were gathered to assess and eventually improve the development of the system. This study also looks into the comparison of semi-manual system and the online reservation.

B. Research Objectives

In order to develop the said system, specific objectives were considered:

1. To develop a system that can perform functionalities like:
   1.1 online customer reservation and transaction;
   1.2 maintenance features for the user account, prices update, payments, confirmation thru email after reservation and report generation; and
   1.3 create dynamic web content management of the system.
2. To identify the information requirements and problems encountered in the existing system.
3. To determine appropriate security and control measures needed for online reservation system.

4. To determine the level of acceptability of the developed system as perceived by the Hostel administrator and staffs, IT experts and prospective clients/end-users in terms of the following criterions:
   4.1 Functionality;
   4.2 Accuracy;
   4.3 Reliability;
   4.4 User-friendliness; and
   4.5 Security.

C. Scope and Delimitation

This study focused mainly on the design and development of an "Online Information and Reservation System BulSU Hostel".

Managing customer reservation through the proper maintenance features and functionalities were incorporated into the developed system. The system also offers features like comments; navigation in viewing the entire building as well as the different rooms and the function hall in animated model.

In describing the sample population of respondents, frequency and percentage distribution were used. Mean scores were computed in describing the level of acceptability of the developed system.

For the limitations of this study, payments in terms of credit cards, pay pals and alert pays are not included for payment. Menu for catering services, customized packages like birthday, debut, anniversaries, baptismal and other occasions are not part of the services offered by the Hostel.

III. PROJECT METHODOLOGY

This study is an applied research which aims at improving a product or a process and even producing results of immediate practical application. In this study, the proponents designed and developed an Online Information System for Bulacan State University Hostel believing to improve the present customer reservations and record keeping system.

In developing the system, the proponents used *Agile model* which is one of the System Development Life Cycle model. Agile is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product.

In using Agile model, it is believed that every project needs to be handled differently and the existing methods need to be tailored to best suit the project requirements. In Agile, the tasks are divided to time boxes (small time frames) to deliver specific features for a release. It has five phases from planning, requirement analysis, designing, building and testing. Iterative approach is taken and working software build is delivered after each iteration. Each build is incremental in terms of features; the final build holds all the features required by the client.

A. Conceptual Framework

Different activities were presented using the Input, Process and Output framework as shown in Fig. 1.
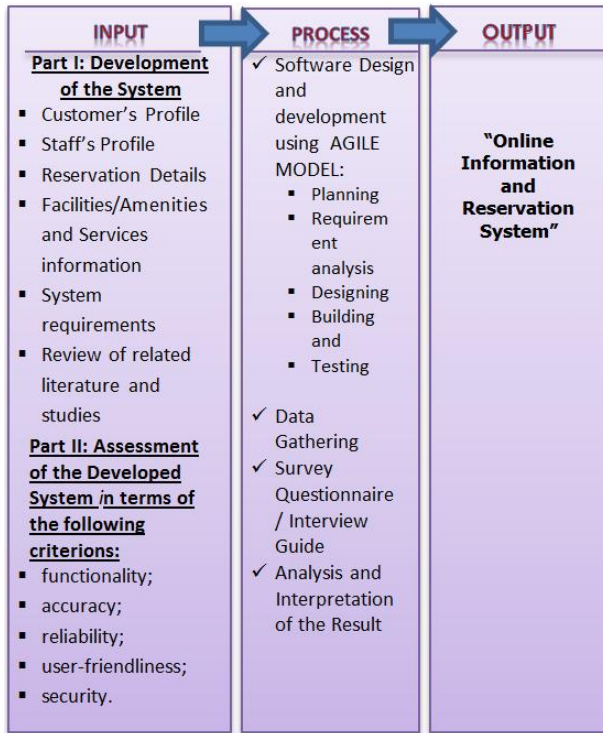
Figure 1.   Input process output model

The *input frame* contains all the necessary information and resources needed in developing the system. Data was gathered concerning the customer's profile, staff's profile, reservation details and facilities/amenities and services information.

Different criterions in determining the level of acceptability were also included like: functionality; accuracy, reliability, user-friendliness and security.

The *process frame* is the activities in which the proponents undergo in developing the system using an Agile Model. And lastly, the *output frame* is the outcome "Online Information and Reservation System" in managing the customer's reservation efficiently at Bulacan State University Hostel.

B.   Software Architecture

Fig. 2 presents the Visual Table of Contents (VTOC) of the Information System of BulSU Hostel which is intended for the use of the Hostel staffs in the *front office* of the system intended for customer's use.

The system provided different user-level which can be used by the staff or front desk, online customers and administrators.

For the *back office* part (Fig. 3) of the website, only the administrator could access the back office of the system.
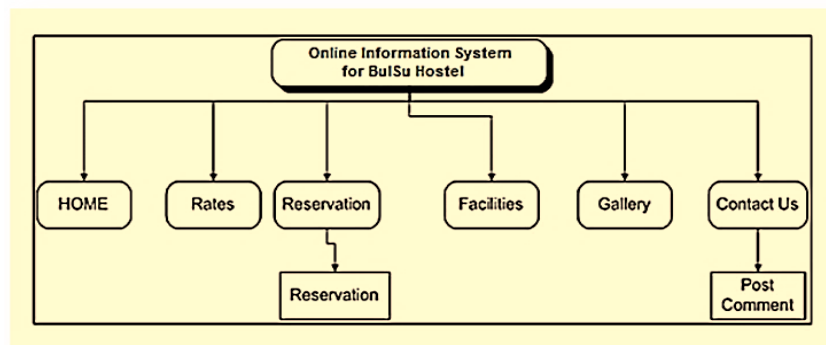
Figure 2.   Visual table of contents of BSU hostel reservation system for front office
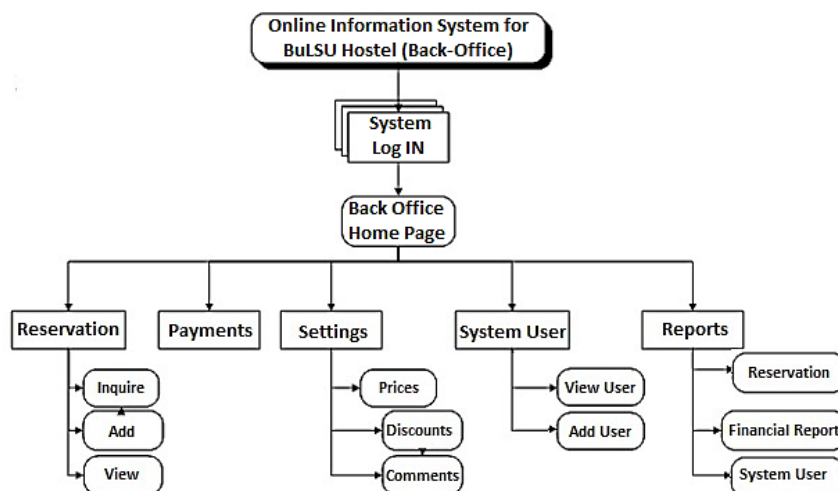

Figure 3.   Visual table of contents of BulSU hostel reservation system for back office
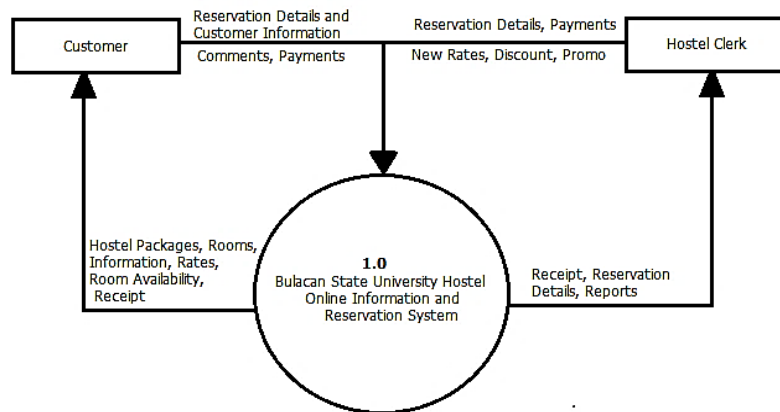
Figure 4.   Context diagram – Level 0

The administrator can also create an account for the staff or front desk and other authorized users to maintain and monitor every transaction done online.

Fig. 4 is the level 0 context diagram of the data flow of the online information and reservation system.

C.   Network Infrastructure

Fig. 5 shows the network infrastructure of the Online Information System of BulSU Hostel.

Since the developed system is a web-based application, Internet connection is very important. The customer can browse the BulSU Hostel website and their reservation transaction can be done.

Through the developed online information system, it allows any public user to search for price and availability of rooms from the hostel website. Once the user is registered as a customer, the hostel information system can be accessed and with that, the registered customer can modify the account's information, can make reservation and print reservation details.
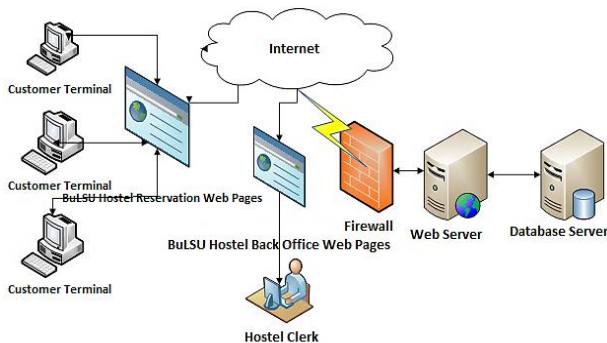
Figure 5.   The network infrastructure

On the part of the website administrator (back office account), the system allows the Hotel Manager (administrator) to make modifications including update price of rooms, modify his account and post comments and promotion campaign on the hotel's website.

In Fig. 6, the reservation process of BulSU Hostel could be done through online transaction. In the existing system, a customer needed to visit the Hostel office to make reservation and inquire for the other services offered by the Hostel.

Still, in the proposed online information and reservation system, the customer can visit the Hostel for reservation and the system will have the same procedure as with the online transaction.
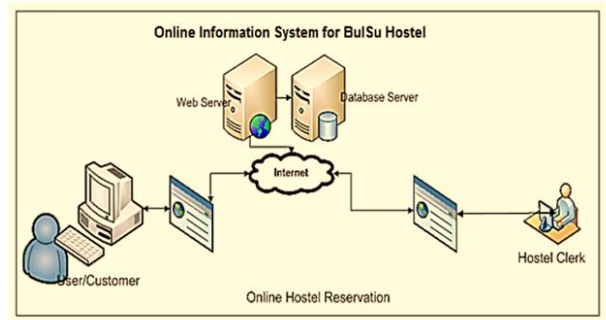

Figure 6.   Online reservation process

Fig. 7 shows the illustration of the walk-in reservation process. For the customer to make reservation, the following steps must be followed:

Step 1: Customer inquires at the Hostel Clerk about the room availability.

Step 2: The Hostel clerk will log in to the System Back Office. He will ask for the date of reservation and what to reserve. Using the System, the clerk can give the availability of the rooms/function hall and the number of vacant rooms.
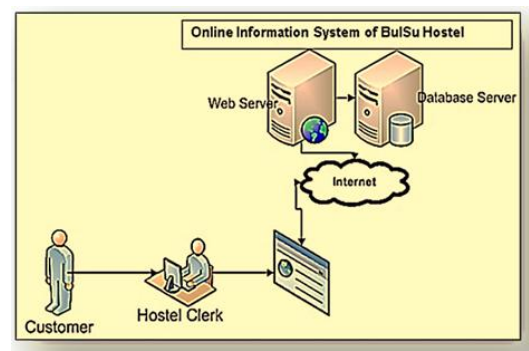

Figure 7.   Walk-in reservation process

Step 3: Once the customer decided to avail the vacant rooms, the clerk will ask the user the basic information for profiling purposes.

Step 4: The clerk will ask the customer if the payment will be done or not to confirmed the reservation. Once the user decided to pay the down payments it will automatically confirmed the reservation.

Step 5: The system will generate an invoice of the partial payments of the customer. Reservation Completed.

Step 6: Reserved room can be cancelled based on the customer and the management agreement.

IV. TESTING AND EVALUATION PROCEDURE

In determining the level of acceptability of the developed software, the administrator and staff of the BulSU Hostel were given an evaluation questionnaire and asked to evaluate the developed system. IT experts and programmers were also asked to evaluate the website through the use of the different criterions for software quality evaluation like Functionality, Accuracy, Reliability, User-friendliness, and Security.

The data analysis was generally descriptive and quantitative. For the results presentation, analysis and interpretation of data, the following statistical tools were utilized: (1) frequency and percentage distribution in describing the classification of the respondents; and (2) weighted mean in determining the level of the system's acceptability concerning the different system criteria. To facilitate the interpretation of the weight mean score of the responses, the upper and the lower limit of scale was adopted using the 5-point Likert Scale as shown below:

NUMERICAL RATING	DESCRIPTIVE INTERPRETATION
4.60 5.00	Acceptable
3.60 − 4.59	Slightly Acceptable
2.60 − 3.59	Neutral
1.60 − 2.59	Slightly Unacceptable
1.0 − 1.59	Unacceptable

Ten (10) IT experts and programmers were also asked to evaluate the developed website. Responses from the prospective clients were also considered by asking them to evaluate the system. Total number of respondents and evaluators are presented in Table I.

TABLE I.   RESPONDENTS AND EVALUATORS OF THE STUDY

Evaluators	Frequency (N)	Percentage (%)
BulSU Hostel Administrator	1	5%
Staff	1	5%
IT Experts and Programmers	10	50%
Prospective Clients	8	40%
Total	20	100%

V. RESULTS AND DISCUSSION

Developing a web site includes web design, web content development, client cooperation, client-side/server-side scripting, web server, network security configuration, and e-commerce development [6].

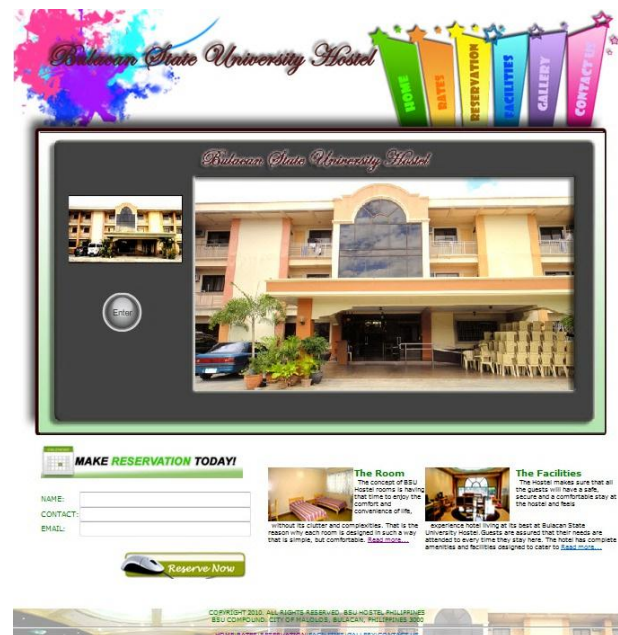Fig. 8 is the Home page of BulSU Hostel Information System.

Figure 8.   BulSU hostel home page

During the development, the web design, content and navigation rules were considered in order for the user to navigate easily around the website.

The customer can navigate from the home page, and can view the Rates and other packages available.

Fig. 9 is the Reservation page at the Front Office which shows the 5 steps for selecting the date and selecting room. The customer can also see the reserved room already.
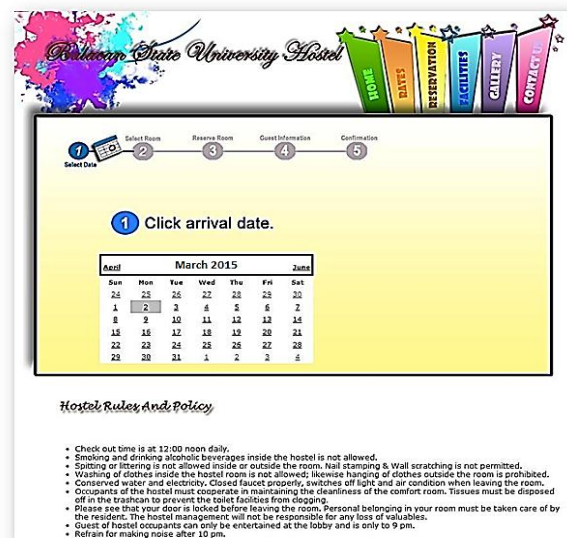

Figure 9.   Reservation page

Hostel rules and policy is also included in this page so that the customer could be familiar and be guided with the rules and regulations while staying at the Hostel.

Fig. 10 is the last step in completing the reservation process.

Figure 10. Confirm reservation form

The summary of the submitted information of the customer will be displayed for checking purposes. Reservation payment procedure is also included in this form.

At the lower part of the form is a note for the customer to wait an email confirmation within 24 hours with a confirmation link. The confirmation link will be expired within 72 hours or 3 days after receiving the email. Contact numbers will be included in the email.

Fig. 11 is the Back Office Reservation Systems which is also the Log-In Form.

Figure 11. Confirm reservation

Figure 12. Welcome form (System Back Office)

The administrator or any authorized user can log-in into the system. The figure below will appear after clicking the Login button.

Inside the System Back Office (Fig. 12), the admin can navigate among the buttons at the left pane.

Different buttons were made available like Reservation, Payments, Settings, System User and Reports.

Table II shows the summary of the computed mean of each software criteria as perceived by the Hostel administrator, staffs, IT experts and prospective clients of the system as follows: functionality, accuracy, reliability, user-friendliness and security. The table also shows the level of acceptability of the developed website.

TABLE II. LEVEL OF ACCEPTABILITY OF THE DEVELOPED SYSTEM

Software Criteria	Computed Mean	Descriptive Interpretation
1. Functionality	4.87	Acceptable
2. Accuracy	4.91	Acceptable
3. Reliability	4.83	Acceptable
4. User-Friendliness	4.95	Acceptable
5. Security	4.89	Acceptable
Overall Mean	4.89	Acceptable

Acceptable (4.60-5.00); Slightly Acceptable (3.60 - 4.59); Neutral (2.60 - 3.59); Slightly Unacceptable (1.60-2.59); Unacceptable (1.00-1.59)

Functionality registered a computed mean of 4.87 with a descriptive interpretation as "Acceptable". Accuracy on the other hand acquired 4.91 which is also interpreted as "Acceptable". Reliability acquired 4.83. A total mean of 4.95 was computed for the website user-friendliness which garnered the highest mean among the other criteria.

Lastly, Security registered 4.89 total mean. For the level of acceptability, all of the mentioned criteria interpreted as "Acceptable" by the respondents, IT experts and prospective customers during the system evaluation.

But since Functionality and Reliability got the lowest mean scores, the proponents considered the comments and suggestions of the evaluators in improving the system.

For the security and control measures, a matrix below shows the accessibility right of every user of the system which applies only on the Back Office application. The following are the different modules that the Administrator can access and modify: Log-in, System User, Upload/Update Price List and Change Password.

Table III is the Security Matrix where the supervisor can access the following modules: Log In, View Reservation, Approved/Declined Reservation, Post Announcement, View Pricelist, Upload/Update Price List and Change Password.

TABLE III. SECURITY MATRIX

Modules	Administrator	Supervisor	User
Log In	✓	✓	✓
View Reservation		✓	✓
Approved/Declined Reservation		✓	
System User	✓		
Post Announcement		✓	
View Pricelist		✓	✓
Upload/Update Price List	✓	✓	
Change Password	✓	✓	✓

VI. CONCLUSION AND RECOMMENDATIONS

The main concern of this study is to design and develop an Online Information and Reservation System for Bulacan State University Hostel in order to manage the customer reservations efficiently and effectively. The system can perform several functionalities in order to accommodate its growing number of customers.

Unlike the existing system where the reservation process cannot be done online, the developed system can be accessed anytime and anywhere by different users from its Front Office which emphasizes the best part of BulSU Hostel, its reservation process and other services. The Back Office on the other hand, could be accessed by the administrator and other authorized users only. In this account, the admin can easily edit or modify the content of the website from the reservation procedure, prices and rates to the different pictures in the gallery. The admin can also delete information, print reports and maintain the website though this account.

Various software specifications were used to develop the website. In determining the level of acceptability of the developed software, the administrator and staff of the BulSU Hostel evaluated the system. IT experts and programmers were also asked to evaluate the website through the use of the different criteria for software quality evaluation based on the equivalent ratings in the Likert scale. In order to test the developed system, the proponents used a local host server for testing and evaluation purposes. Part of Project Evaluation is to conduct post-implementation reviews at the end of the project to validate the completion of the developed system for assessment and further improvement.

For the recommendations, a pilot test should be conducted to all possible end-users of the system to draw more recommendations.

It is also recommended for the BulSU Hostel to accept reservation payment using Paypal, AlertPay and credit cards. Both PayPal and AlertPay allow for transactions in multiple currencies. However, PayPal automatically converts foreign currency payments into base currency.

Maintenance of the developed website is also recommended. The administrator should maintain and update the different room rates and discounts. Pictures in the gallery section should also be updated.

Future researcher can also consider developing a system in other web programming language like PHP, MySQL and other freeware languages.

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Mayleen Dorcas B. Castro was born in Malolos City, Bulacan, Philippines on May 2, 1979. She received her BS and MS degree at Bulacan State University (BulSU). Her thesis focuses on the design and development of an online reservation and information system for BulSU Hostel. She is also a Ph.D student major in Educational Management and completed 54 units already. But because she wanted to be academically aligned in her profession, she enrolled in a Doctor of Information Technology (DIT) program at Angeles University Foundation (AUF).

Eunice B. Custodio was born in Mindoro Oriental, Philippines on April 8, 1976. She received her B.S and Master's degree from Bulacan State University (BulSU). She is already on the process of finishing her Dissertation in a Ph.D program. Her research focuses on the skills mismatch needed by the industries which address the gap of the academe and industry. She is also enrolled in a Doctor of Information Technology (DIT) program at Angeles University Foundation (AUF).