

**SE 201.3 - Systems Analysis and Design**

**Group Assignment**

**Hotel Management System**  
**White Villa Resort and Spa-Galle**  
**Project Report**

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Submitted by:

- Marshi Mendis
- Akila Dilmin



## Abstract

This documentation is report document for the White Villa Resort, The previous system of White Villa Resort was a manual system and they needed to automate the system which is more efficient and time saving. Prevailing manual log book based system used by the White Villa Resort, caused many inconveniences regarding the day to day operations of the hotel impacting on the growth and efficiency of the hotel. Object Oriented Approach was given priority throughout the project while software development life cycle was merely adducting to the Iterative Waterfall life cycle method. Accessing the project work within the above-mentioned scope made the project workload a bit easier and hazardless and the system evaluation was done weighting equally allocating the best set of people with accordance to their specific criteria. The solution or the results abbreviated from the above evaluation has a great impact on the future or further maintenance of the system. So, this completed computerized system would play a major role in the day to day operations of the White Villa Resort with no doubt.

## Acknowledgement

We would like to express our gratitude and appreciation to our Lecturer Ms.Chalani Oruthotarachchi, who immensely helped and guided us to improve this project in many ways, and provided wealthy information for stimulating suggestions and encouragement, helped us to coordinate our project. Also, we would like to thank every employee of the White Villa Resort adjoining to departments along with the General Manager of the Hotel, Ms.Senaka who provided us the necessary arrangements to identify and recognize the prevailing operational structure of the hotel even by providing strategic information as required.

This project consists of all the aspects of Information Technology, so every module we learnt helped a lot to achieve this success. Hence, we would like to thank all the lecturers and lab instructors who paved our path in this road of success.

Although we are unable to name the specific individuals, all their help is warmly appreciated and we would like to thank and show our gratitude to everyone who helped us in many ways to complete this project successfully.

## Declaration

We declare that this project report or part of it was not a copy of a document done by any organization, university any other institute or a previous student project group at NSBM and was not copied from the Internet or other sources.

### Project Details

Project Title	Hotel Management System for White Villa Resort and Spa-Galle
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### Group Members

Reg. No	Name	Signature
10018731 BSC-NSBM-SWE-17.1-038	D.Marshi Saskiya Mendis	
10018725 BSC-NSBM-MIS-17.1-024	Akila Dilmin Hettiaracchi	

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## List of Acronyms and Abbreviations

IEEE	Institute of Electrical and Electronic Engineers
EER	Enhanced Entity Relationship
SQL	Structured Query Language
UI	User Interface
AD/ACT	Activity Diagram
Admin	Administrator



# **1. Introduction**

## **1.1 Problem Statement**

Through the problem statement this document would clearly depict the operational functionalities of the White Villa Resort before the system development which lead to numerous inefficiencies that can be judged as a problem from the outside scope of the hotel. So, simply it would be the prevailing log book based system with no doubt. Through this document the problem statement has been addressed through operational functionalities relating to the specific departments.

### **Bar Management**

Currently the hotel has a manual bar management system. They have log book based system and it keeps allocating the hotel space forming junk of files and papers that makes really difficulty in a situation like retrieving any past information through those files. And, the loss of information has to be bearded by the hotel if any physical damage had happened to the files. Also, unauthorized people may access theses files and there will be a situation like leakage of critical information. So, all with these things it will waste time and labor within the hotel environment.

### **Pool and Spa Management**

When it comes to reservations of pool and spa each time the reservation information must be entered manually, even if the same customer is reserving 2 or more packages of spa the receptionist must enter details separately and also bill them separately. This will be time consuming and again cause frustration to the customer as well. When it comes to pool and spa management reservations of pool from both indoor and outdoor guests, reservations of spa from only indoor guests, staff allocations for spa and pool duties and cleaning, bill calculations, managing stock items relevant to pool and spa will be difficult to handle by current manual system.

## **Inventory Management**

Currently the inventory of the hotel is maintained under the Food and Beverages department and all the inventories are recorded in a bin card system. For beverages the purchased items are recorded after the purchase confirmation of the finance department and it is recorded on per quantity based. For food the purchased items are also recorded after the purchase confirmation of the finance department, but it is recorded on a per gram or kilogram basis. Also, the inventory make purchases for the equipment needed for the house keeping department and for the spa and pool and that too is recorded on a log book. The delivery of the purchased items is too done on bin card system as above within the same format. Also, the inventory keeps track on the expiry dates of all the products on log book. Since all the mentioned items above are recorded manually it is too erroneous and inefficient.

## **Finance Management**

Within the current manually file based system, updating and maintaining transaction information is time consuming and risk of error percentage is high. It is extremely difficult and time consuming to search past information from the files. This will lead to frustration of the employee and customers as well. Monthly and annual sales and account reports comprising income, expenses and loss information is critical to generate while using a manual file based system. By using a manual file based system it is difficult to analysis hence it is infeasible to generate statistic therefore It will become disadvantage for the hotel such as to advertise among the countries, to get a new development decision for the next step etc.

## **Front Office Management**

Front office staff make notes of reservations in a temporary book. After the guest arrives that record is copied to a card called guest card. That card should be updated when the customer checks in checks out and even whether the customer get a meal. That's very hard to go through all the customer cards and find out the card which is having the customer data of the exact customer which is to be updated.

When maintaining guests' records, some customer data might need to be updated. At that process guest information recorded in all the departments should be manually updated. That makes hotel staff annoying.

## **Housekeeping and Laundry Management**

With this manual system currently in place, entering all information must be done manually. In laundry management system, even if the same customer is ordering more than one time, the laundry manager must enter the details separately and bill the separately. This will be time consuming and again cause frustration to the customer as well. When it's come to housekeeping, if a worker takes a leave, it's difficult to assign another worker because they must check all the other records of duties. Under the manual system it's difficult to handle.

## **Restaurant Management**

The Restaurant Management System at Hotel Lady Hill maintains a manual system. The restaurant stores all order details in a log book based system and it takes more time leading to the frustration of the employees working within the restaurant. Also processing bills and receipts for the walk-in customers will time consuming on high season times. They maintain their bill processing system again on a file based one which is less efficient. Tracking of items at the restaurant uses lot of paperwork which will be leading to the use of hotel space with all the junk papers and files when they are not in a usable form.

## **System and Employee Management**

In the current system, like customers, entering all employee information has to be done manually. This again leads to space, effort and resource wastage, all of which can be put to better, much productive use. The manual system will create difficulties when it comes to rewarding bonuses and incentives for the best employees. But under the current manual system, achieving this would be extremely difficult. Currently all financial records and customer, employee, supplier information among others is accessible to any staff member of the hotel. Currently system uses a manual attendance sheet to keep attendance records. It is time consuming and difficult to handle. Currently system uses a manual employee registration system to register new employees and it is difficult to handle manual system.

## 1.2 Product Scope

The system is compromised with department based sub systems with functionalities relating to those departments with separate color-coded user interfaces that make it easy to be used within the department. The centralized data base and the interactive user interfaces make it easy for the system users to use it without any specific training. It also provides the capabilities such as retrieval of information, modification of information in terms of data access contrasting to that of a file based system. It controls all the operations with relevant to the department within the hotel environment. All the activities happening through day to day operations of the system is tracked to maintain the order within the hotel environment. It also provides various tools and system functionalities in addition to the required system functionalities that gives specific information such as analysis through automation which will be efficient in terms of strategic decision making. The following would be some common key factors of the system.

- Centralized Database
- User interfaces with color codes specific to departments
- Analysis formation based on strategic, management and operational levels
- Zero redundancy
- Implemented high security
- Separated user levels

Also after the completed system development basic manual operations were covered relevant to the specific department while implementing more system functionalities with related to those departments.

## **Bar Management**

A separate interface was used as the main interface for the bar management operation. Sub interfaces were created which carry out the operational processes of with regarding to the bar management process. A limited bar stock is maintained through the system which would be adjoining to the inventory or the stock through tables. Entry of data, search of data, delete of data and update of data will be carried out with regarding to each customer order. For each new detail, the database will be updated along with the system operation.

## **Pool and Spa Management**

Automated system with interfaces separated for the pool and spa management process makes multiple reservations for spa to the same customer if needed. Reservations of pool is done without human errors. A separate interface automates bill calculation and if this bill owns an indoor customer it will send to the front office and will be added to his min bill. If this customer is an outdoor one he can pay his bill to the receptionist. Also, there is another interface to accumulate staff with relevant duties for them which is recorded and prompted. Another interface manages pool and spa stock items and these details will be taken by stock managing department for its purposes.

## **Inventory Management**

The automated computerized system for the inventory process is handled by the staff members who are within the Food and Beverages department and there are user friendly interfaces with a separate color code that record all the product details about the inventory system on a database. The interfaces are categorized according to the major components and it gives prompt messages about the available stocks and expiry dates of the products.

## **Finance Management**

There are separate interfaces to calculate all the related account information and to clarify them automatically with related reports that generate monthly and annual accounts and sales reports including incomes, expenses, cost of sales, losses transaction information and statistic reports. System functionalities are provided to insert, update, delete, and search of the account and journal transaction information according to the interfaces that they are assigned to.

## **Front Office Management**

The automated system interfaces for the front office staff finds the correct guest record and then updated it. Same database is shared like for the other departments which is updated according to the relevant interface data of the front office interfaces. Also, the system uses a color code separated for the front office that can get versatile according to the data entry, search, delete and update.

## **Housekeeping and Laundry Management**

Automated system makes multiple orders for laundry, to same customer regarding the relevant interface and the system records that order details easily and quickly through the much versatile interfaces designed for the Housekeeping and Laundry Management department. The System interfaces automatically calculates the amount correctly and stores in the common database. When worker takes a leave in housekeeping section, system will automatically allocate another worker for that duty.

## **Restaurant Management**

The automated system interfaces with interfaces separated by well-organized structure along with color codes will provide a versatile formation for the process of restaurant management. The system interfaces bring together billing process, menu management, and food costing into a neatly bundled package. All the information regarding transaction related to the restaurant is recorded through system interfaces organized separately and will be sent to the database which is retrievable on anytime. The KOT (Kitchen Order Token) Management, paced a printer to the kitchen which connected to restaurant desktop.

## **System and Employee Management**

Enables admin to create, delete, update and store Employee records. Admin can search employees by their name, salary, city etc... When admin search for user it display his/her picture too which will easier to recognize the employee. The system interface also provides facilities of a payroll system which enables user to generate Pay slips too.



### **1.3 Project Report Structure**

The project report for the finalized completed system of the White Villa Resort Galle compromised and designed with relating to the standards standardized by the IEEE organization and the content is organized in a way that is user friendly to the reader where anyone with general capabilities could read and understand its content. Also, it is structured in a way where it can be modified in future when it comes to system maintenance and complete modifications or reorganization of the prevailing system so that abstract parts can be included later on. The documentation with diagrammatic and tabular expressions will also give logical and pictorial views on the system to the user.

## 2. Methodology

### 2.1 Requirements and Analysis

We have gathered requirements by meetings and perceptions. The data accumulated in these sessions were examined to distinguish the necessities of the undertaking. Since the procedures of the organization are interconnected, organization was experiencing issues to oversee them proficiently. Hotel Management System was presented as the primary answer for the challenges they were confronting. And, eight sub functions were distinguished during this process.

- Front Office Management

Front office manager logs into the system and check the status of the rooms. When a guest comes ask for a room he opens the Add New Guest interface and check for available rooms. If a room state is set to Available, he selects that room and ask for the package the guest want. He selects the package and ask for guest's personal details. He enters the personal details to the system and press Register button. Now guest's details are recorded in the system and then guest go to the room.

When the guest need to checkout he must come to the front office and settle the final bill. After that guest record is updated as checked out and the room status is updated to Cleaning. Front office manager can view summary of the past guests monthly and annually from Guests History interface. He can filter guests' traffic according to country and take important decisions for promotions

- System and Employee Management

When the user input username and password, this function check whether both of them are valid or not. If the login details are invalid, a message box will be displayed informing that the login details are invalid if the login details are valid, function checks the authority level of the user according to the login details

(Authority Levels - Admin, Receptionist, store keeper, laundry manager, etc.)

According to the authority level, the correct main interface will be displayed All the employees (staff members) who has an account in the system, can communicate with each other when somebody gets a message from any other staff member he will see a notification. All staff members can view their inbox and outbox.

- Log in Function

When the user input username and password, this function check whether both are valid or not. if the login details are invalid, a message box will be displayed informing that the login details are invalid. If the login details are valid, function checks the authority level of the user according to the login details (Authority Levels – Admin, Receptionist, store keeper, laundry manager, etc.). According to the authority level, the correct main interface will be displayed. All the employees (staff members) who has an account in the system, can communicate with each other. When somebody gets a message from any other staff member he will see a notification. All staff members can view their inbox and outbox.

- Restaurant Management

- Finance Management

- House Keeping and Laundry Management

This function is responsible of getting orders from customer and record that details easily. After that calculate the average cost for that order. In housekeeping section, assign the workers to do their duties and get weekly report. If a worker takes a leave, assign another worker and create a report. When a customer reserves a room, manger check the attendance and assign a worker to clean that reserved room.

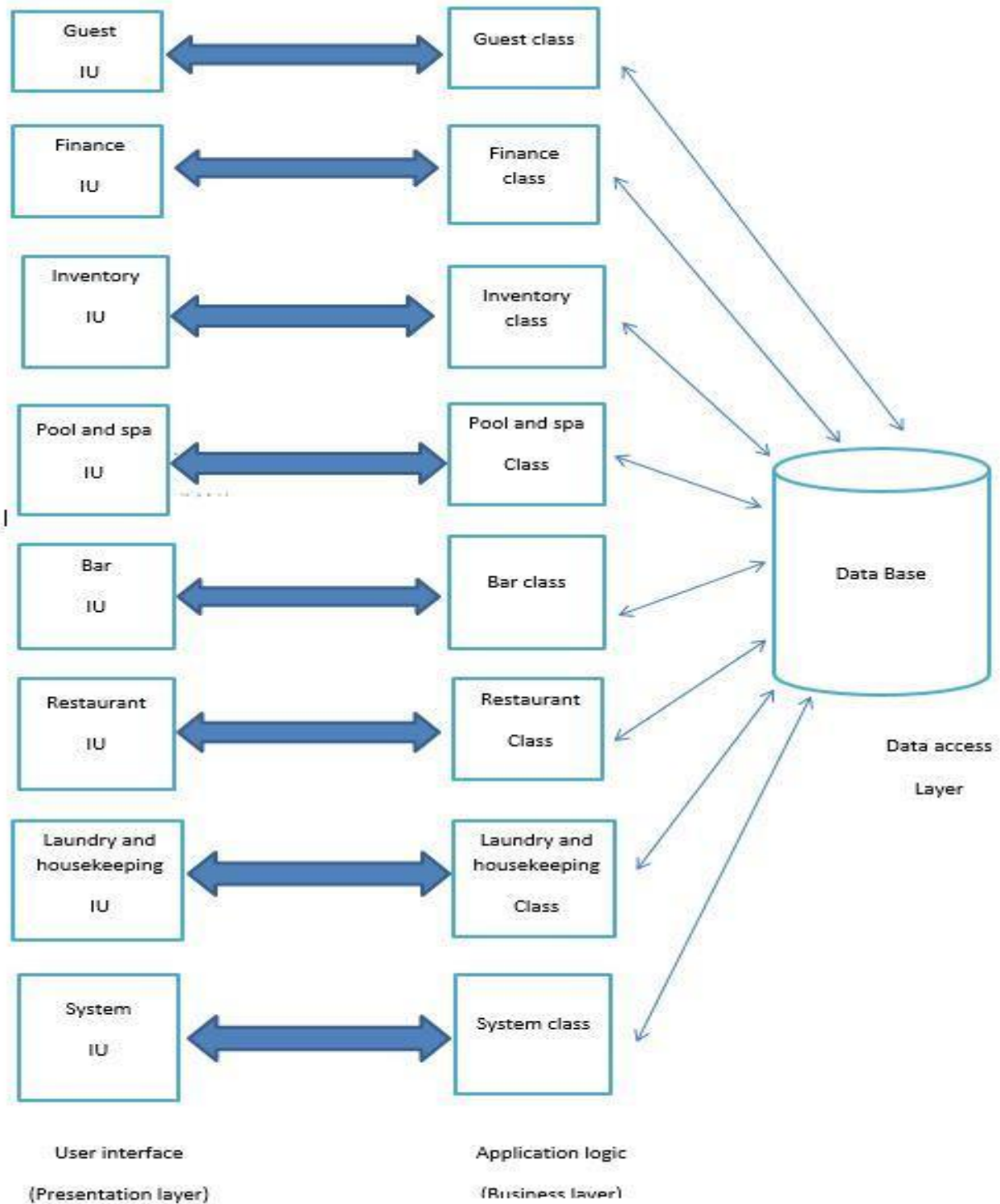
- Inventory Management

This has several functions that handles the inventory processes, mainly entering the stock details after categorizing the stock, and sub functions that depend upon the stock detail entered. This shows available stock within the inventory after getting tallied with the stock in and stock out. Also this shows expired food with regard to the current date and finally this analysis the stock in and stock out processes on charts.

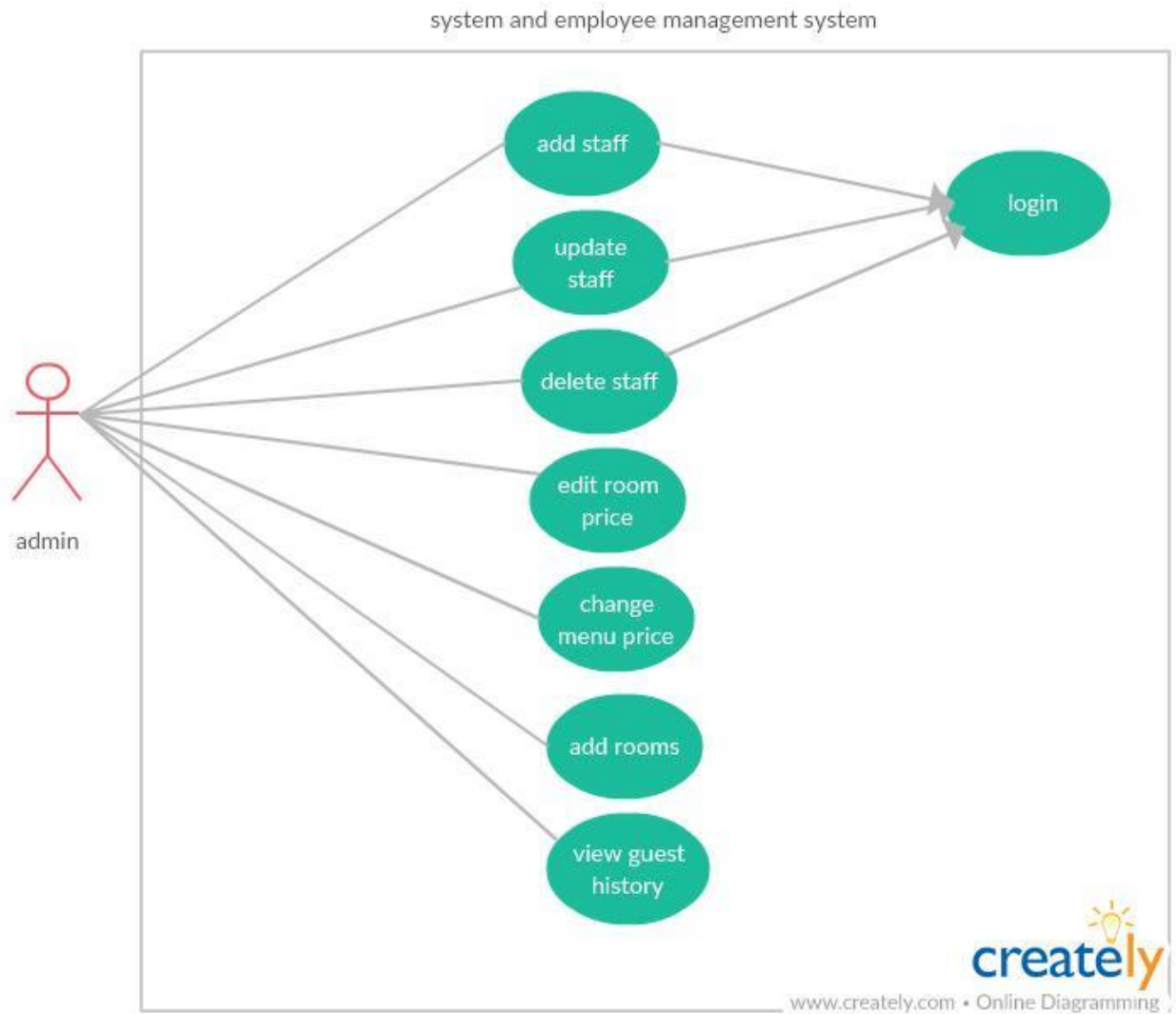
- Bar Management

When the customer came, bartender will get the order .After that system get the details about the items and calculate the grand total. If pay in a credit card, system get the credit card number and complete the order giving a printed invoice. When bartender needs to know about the sales, he can view all the record.

## 2.2 Design

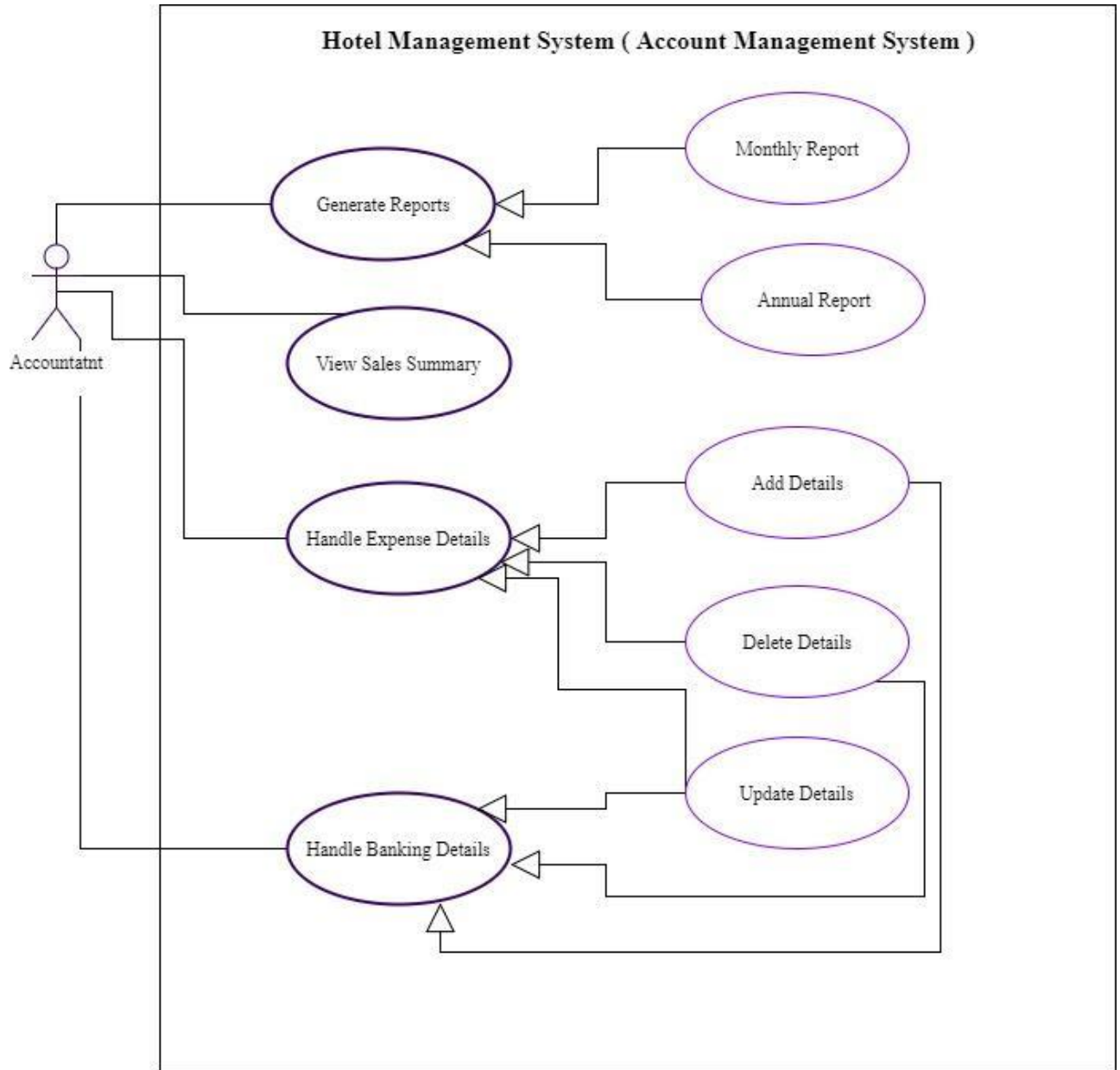


### 2.1.1 System and Employee Management System



2.1.1 System and Employee Management Use case Diagram

### 2.1.2 Finance Management



Login Assumption: In order to perform all the actions related to Accountatnt should have to login to the system. That include function is nor mentioned in the above use case diagram because usecase need to be clear to read

Figure 2.1.2. Finance Management System Use Case Diagram

### 2.1.3 Bar Management

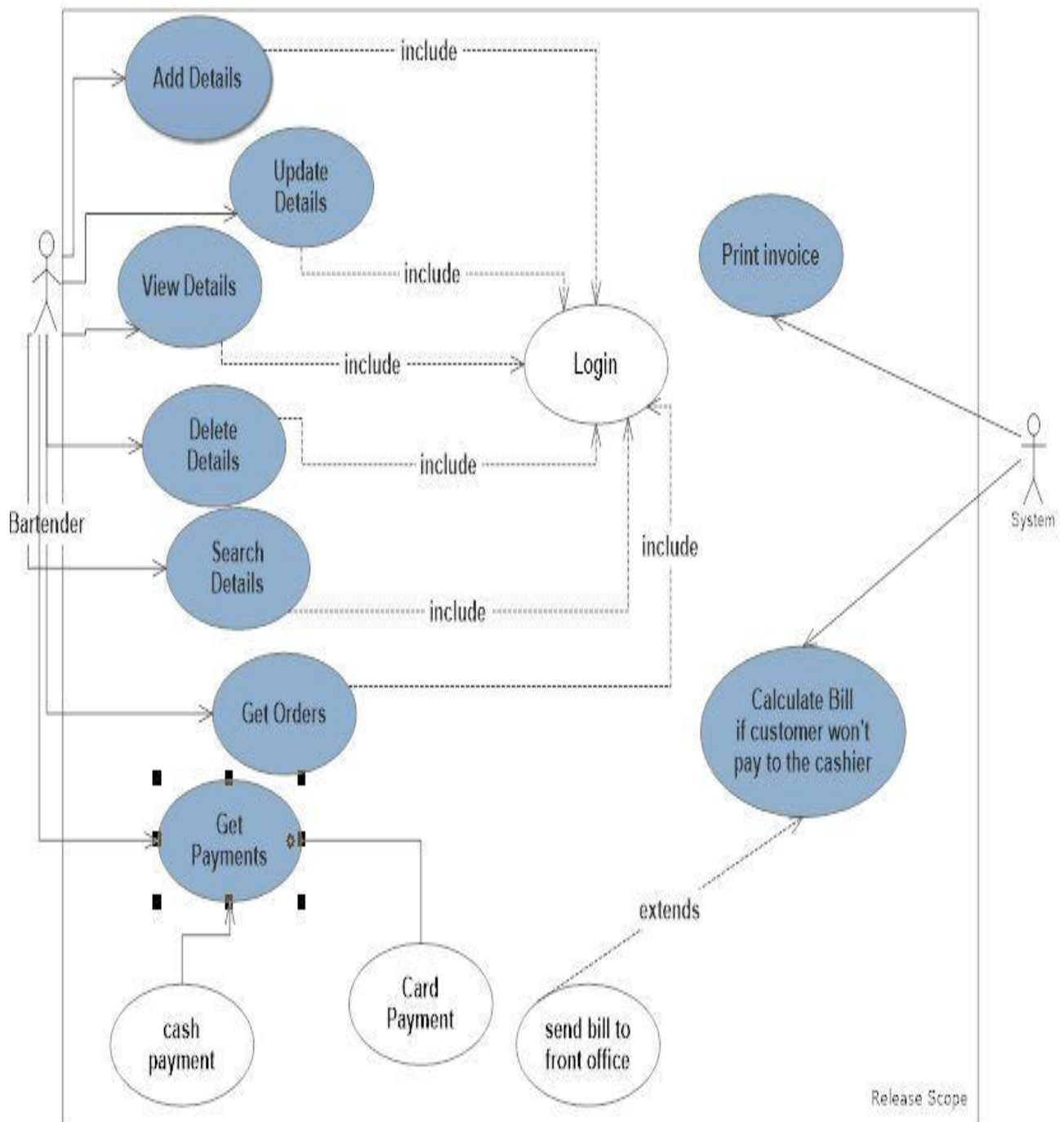




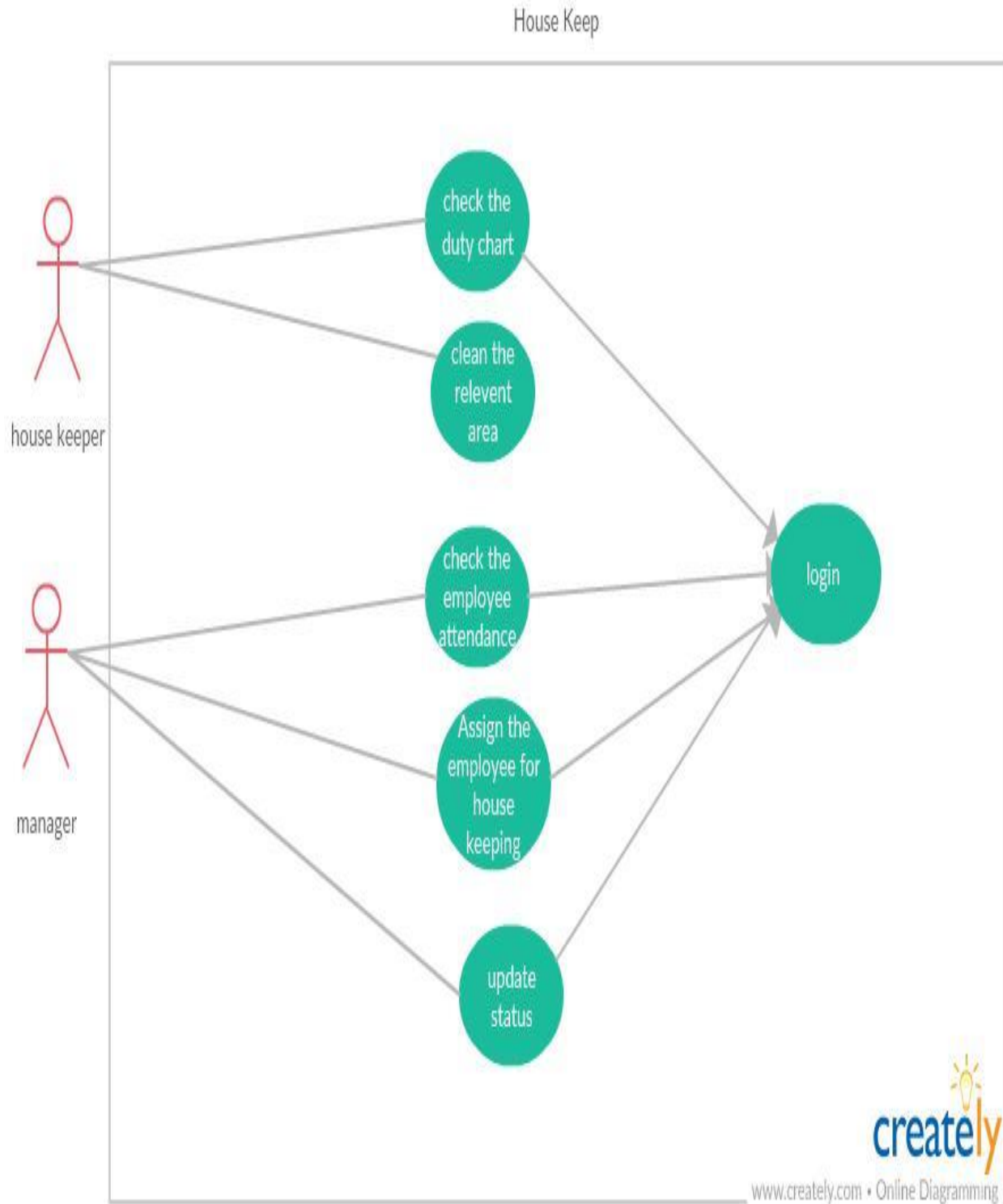
Figure2.1.3 bar Management System Use Case Diagram

#### 2.1.3.1 Calculate Total Bill

Use case name	calculate total bill
Preconditions	system display login screen on the system
Primary actor	bar tender
Main flow	<ol style="list-style-type: none"><li>1. bar tender enter his username and password.</li><li>2. system validates entered username and password.</li><li>3. system allow user to login into system.</li><li>4.system ask bar tender to enter the order items.</li><li>5. system get the values for the relevant items from the items table.</li><li>6. system calculate the grand total.</li><li>7.system updates data of items in the database.</li></ol>

	8. system print an invoice for the relevant payment method.
Extensions	<p>1.a. If username and password failed, system asks to verify them again.</p> <p>8.a. If it is a cash payment, print an invoice.</p> <p>8.a If it is a card payment, validate the card and print an invoice.</p> <p>8.a. If customer not paying the bill to the bar cashier, bill will be send to the front office.</p>

#### 2.1.4 Housekeeping



## Housekeeping Use Case Diagram

Use Case Name	Assign employee for housekeeping
Pre Condition	User must be logged into the system
Primary Actor	Manager
Main Success Scenario	<p>1.manager log into the system</p> <p>2. system validates entered username and password.</p> <p>3. system allow user to login into system.</p> <p>4.create the schedule by entering relevant details.</p> <p>5.Make a report and get a printout</p>
Extension	If login information which provided by user is incorrect error message will be displayed.

### 2.1.5 Restaurant Management

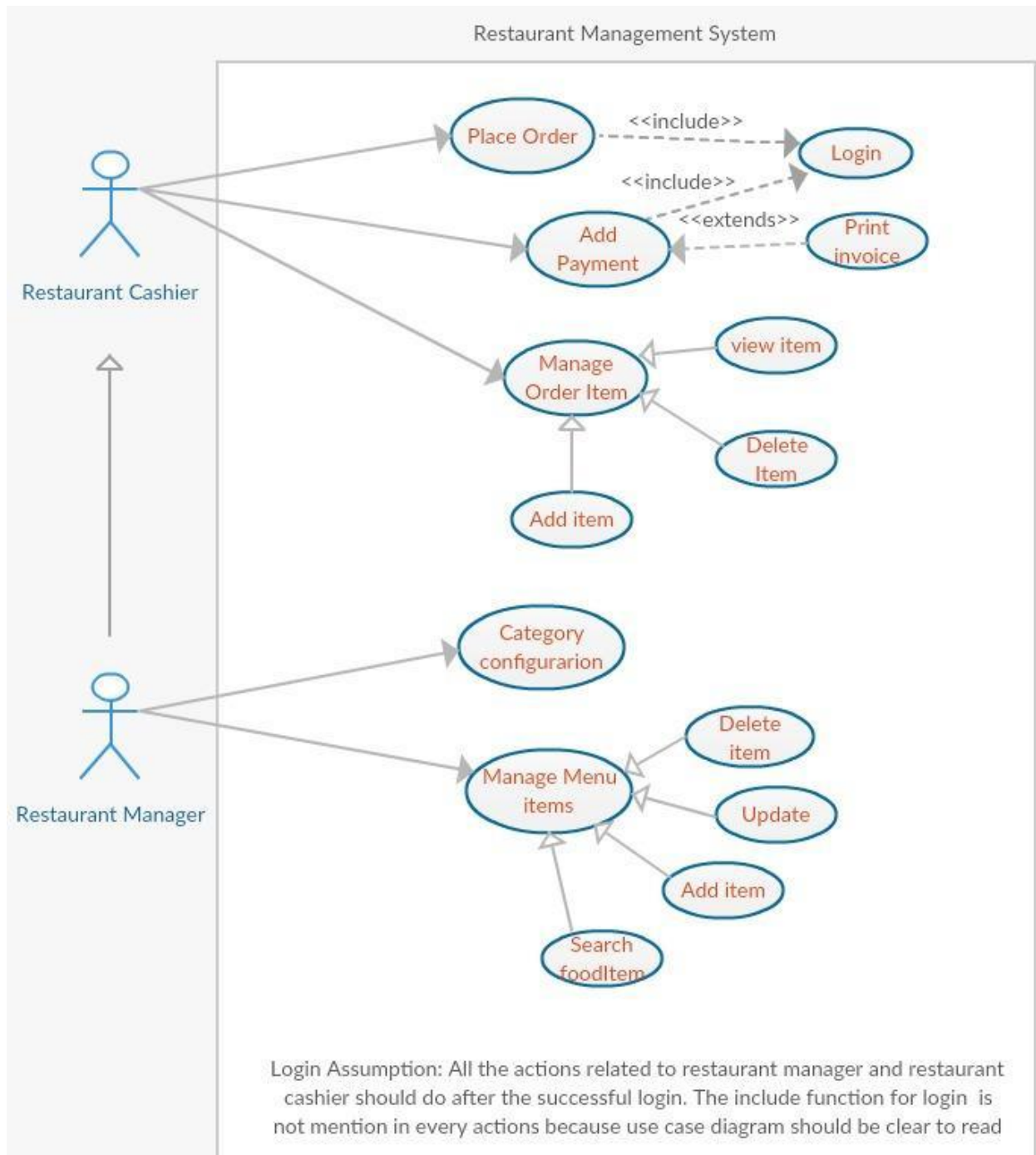


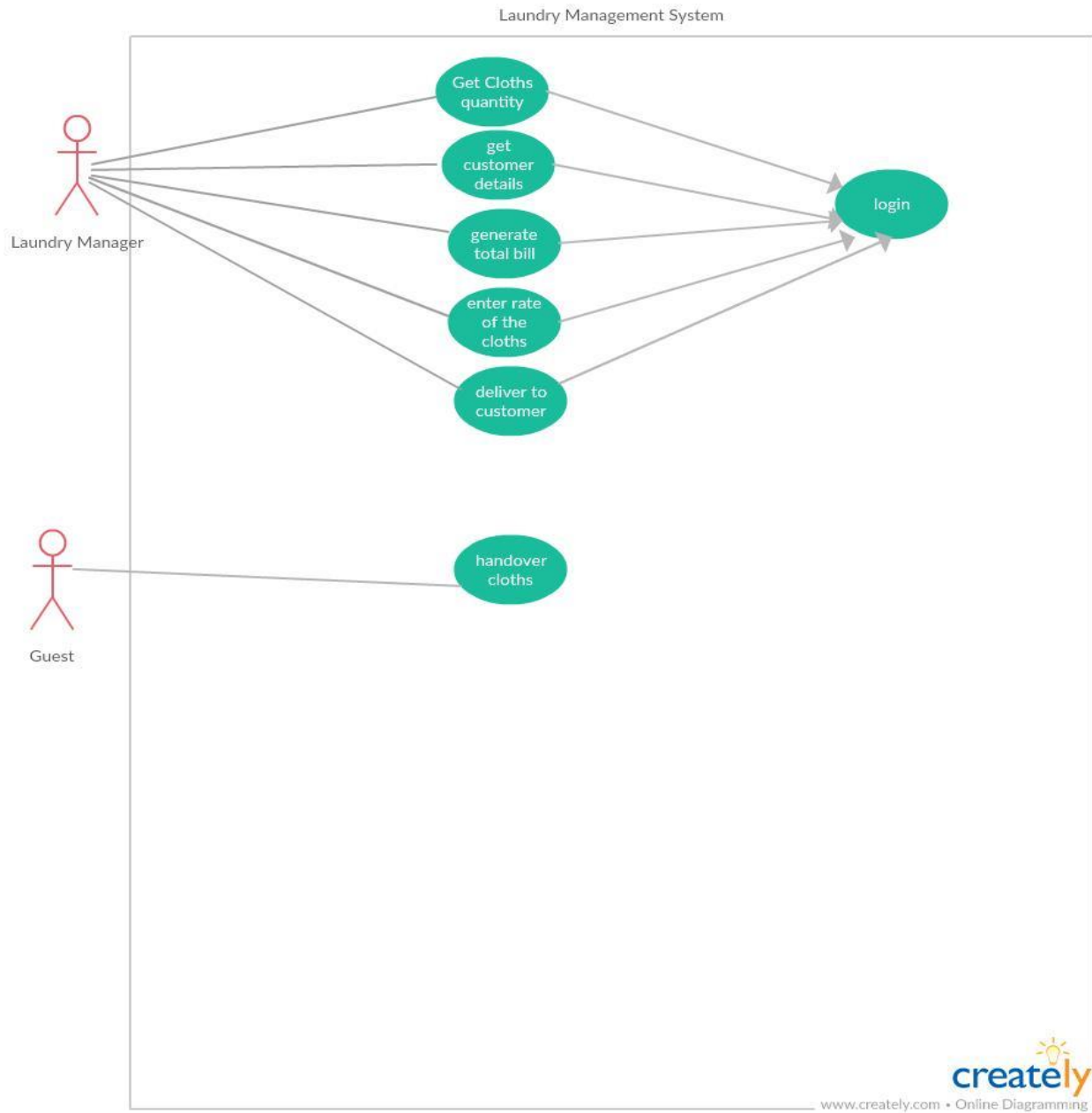
Figure 2.1.5 Restaurant Management Use Case Diagram

### 2.1.5.1 Place Order

Use Case Name	Place Order
Pre-Condition	User must be logged into the system
Primary Actor	Restaurant cashier
Main Success Scenario	<ol style="list-style-type: none"><li>1. include: login to the system</li><li>2. The system Display Main Screen</li><li>3. The User Selects Order Menu</li><li>4. User Enters the key word for food item and click the search button</li><li>5. System displays the matching food items according to search keyword</li><li>6. User selects the food item and quantity and Enter Add table</li><li>7. User Press Order button</li><li>8. The System records Order Details</li><li>9. System Calculate grand total</li><li>10. User Selects Payment mode and Submit the payment</li><li>11. System verify the Payment</li><li>12. System Record The Payment</li></ol>
Extension	<p>1a) if the login credentials are incorrect the system will display the logging screen again to enter user name and password</p> <p>7a) Order Table has been updated</p>

	<p>9a) If Payment credentials are incorrect system will prompt an error message and ask for re-enter the payment details again</p> <p>12a) Sales bill table and customer table has been updated</p>
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### 2.1.6 Laundry management



2.1.6. Laundry Management Use Case Diagram



### 2.1.6.1 Add Customer Details

Use Case Name	Add Customer Details
Pre Condition	User must be logged into system.
Primary Actor	Laundry manager
Main Success Scenario	<ol style="list-style-type: none"><li>1.Laundry manager log into the system</li><li>2. system validates entered username and password.</li><li>3. system allow user to login into system.</li><li>4.User can select new customer option.</li><li>5.User can enter the relevant details about customer.</li><li>6.Enter the quantity of the cloths</li><li>7.calculate the sub total.</li></ol>

Extension	If login information which provided by user is incorrect error message will be displayed.
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#### 2.1.7.1 Register A New Guest

Use Case Name	Front office manager registers a new guest
Pre-Condition	Available rooms should be there for the guest
Primary Actor	Front office manager
Main Success Scenario	1)Front office manager logs into the system  2)login validated  3)Search for available rooms according to guests requirements  4)enter guest's personal information  5)select package information according to the customer's requirements

	<p>6)Press register button and store details in the system</p> <p>7)Guest get the key for room</p>
Extension	<p>1.a)invalid login</p> <p>1.a.1)re-enter login credentials</p> <p>3.a) no rooms available</p> <p>3.a.1)guests leave the hotel</p>

#### 2.1.8.1 Enter Stock Details

Use Case	Enter Stock Details
Brief Description	This use case describes how the Stock Manager  input the Stock details to the system.
Actors	Inventory, Stock Manager
Preconditions	<ul style="list-style-type: none"><li>• There is a Stock In from a supplier.</li><li>• There is a request for a Stock Out from a department.</li></ul>
Post conditions	<ul style="list-style-type: none"><li>• Received or Released stock from the inventory is non-returnable or non-guidable.</li></ul>
Main Flow	<ol style="list-style-type: none"><li>1. Stock Manager begins the use case by logging in to the computer.</li><li>2. Stock manager the enters the user id and logging password.</li><li>3. The System displays the main inventory interface.</li><li>4. Stock Details interface is displayed.</li><li>5. Stock Manager enters the Stock Details.</li><li>6. The systems prompt for successful data entry.</li><li>7. The use case ends when the Stock Manger logged out from the system.</li></ol>

Alternative Flows / Extensions	<p>2.A.1) If the password is invalid the system prompt to reenter the password.</p> <p>5.A.1) If entered details are not match according to the data type of the field, the system prompts an error message.</p>
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## 2.2 Diagram

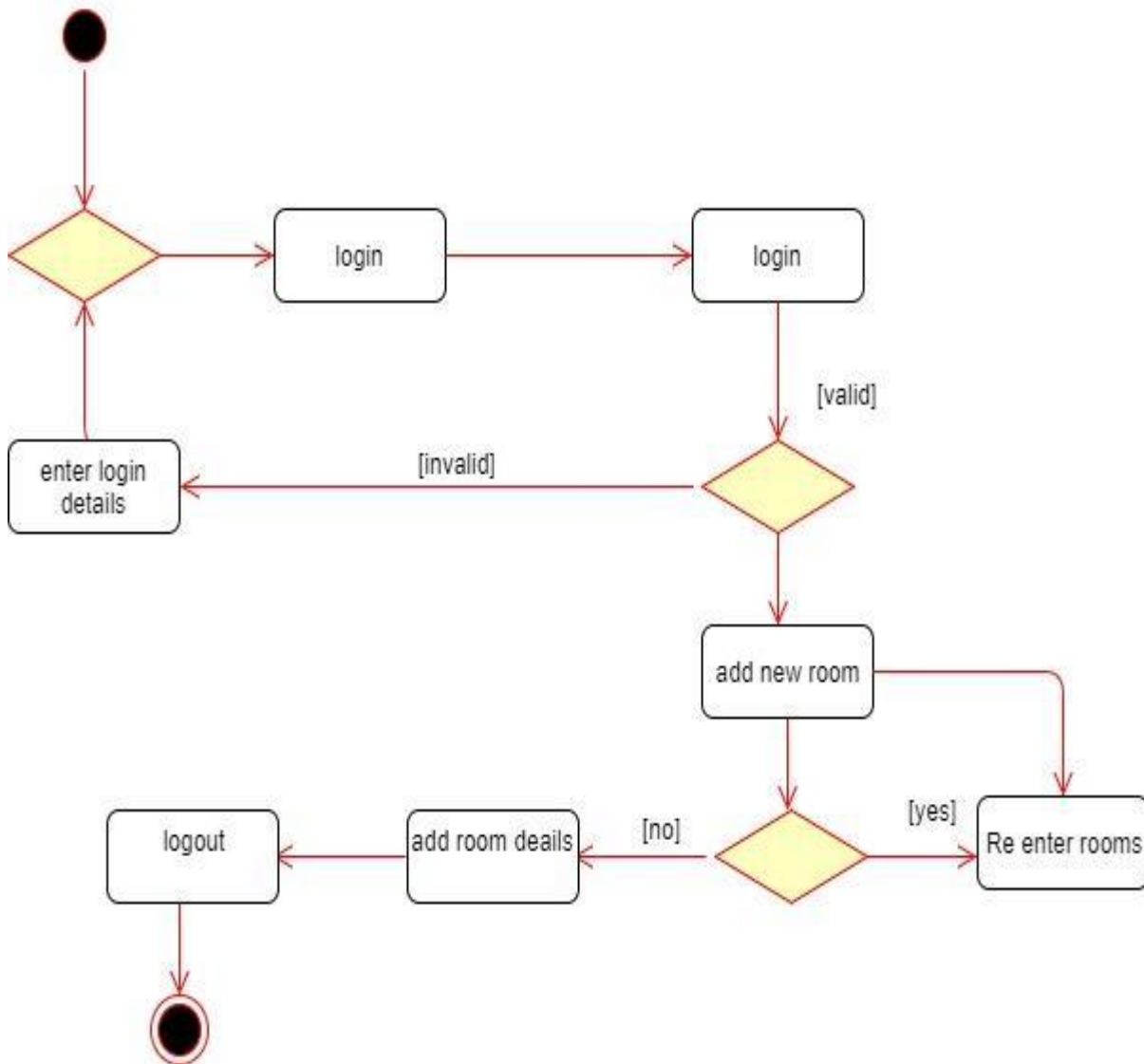


Figure 2.2.1 System and Employee Management System Activity Diagram

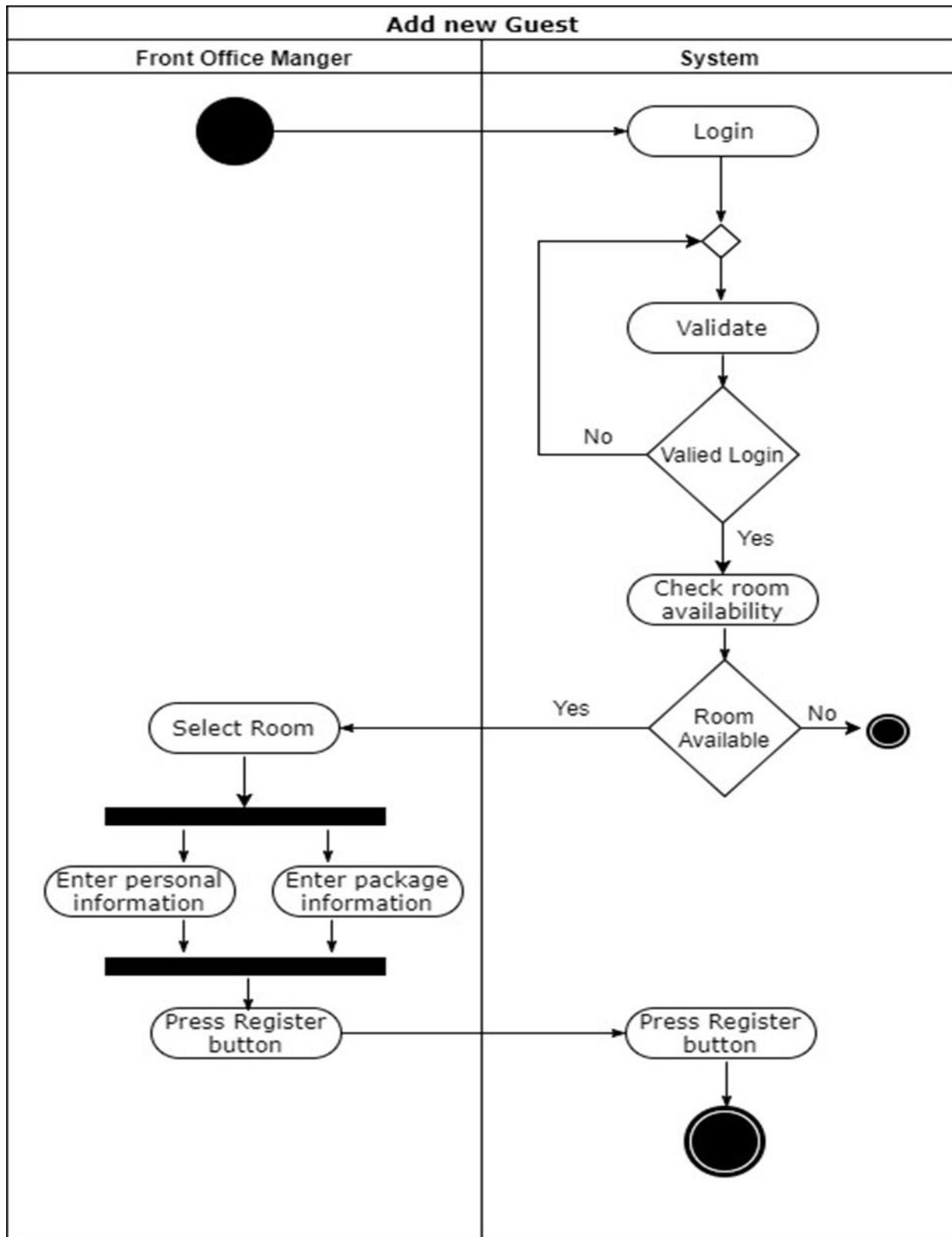


Figure 2.2.2 Front Office Management Activity Diagram

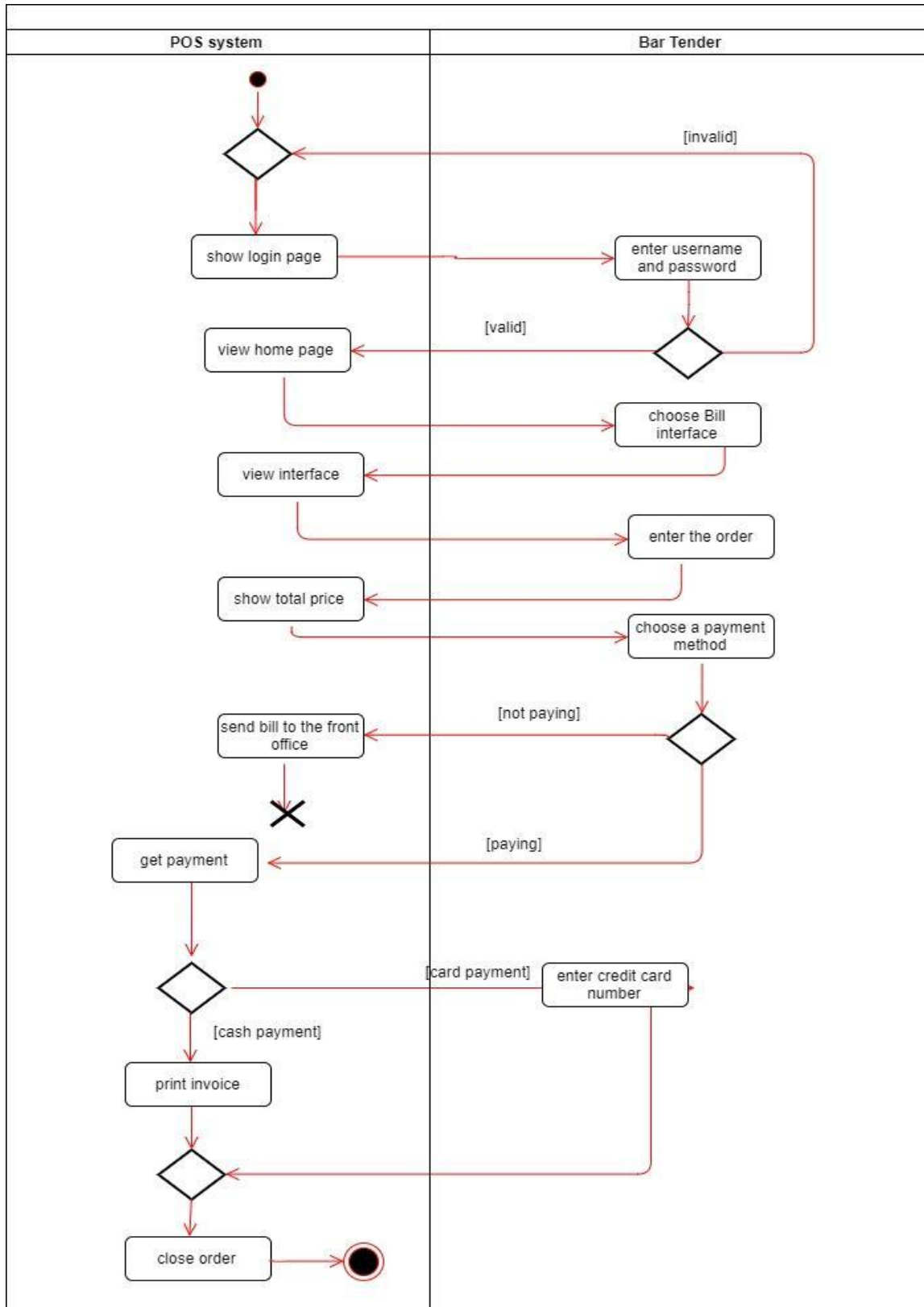


Figure 2.2.3 Bar Management System Activity Diagram



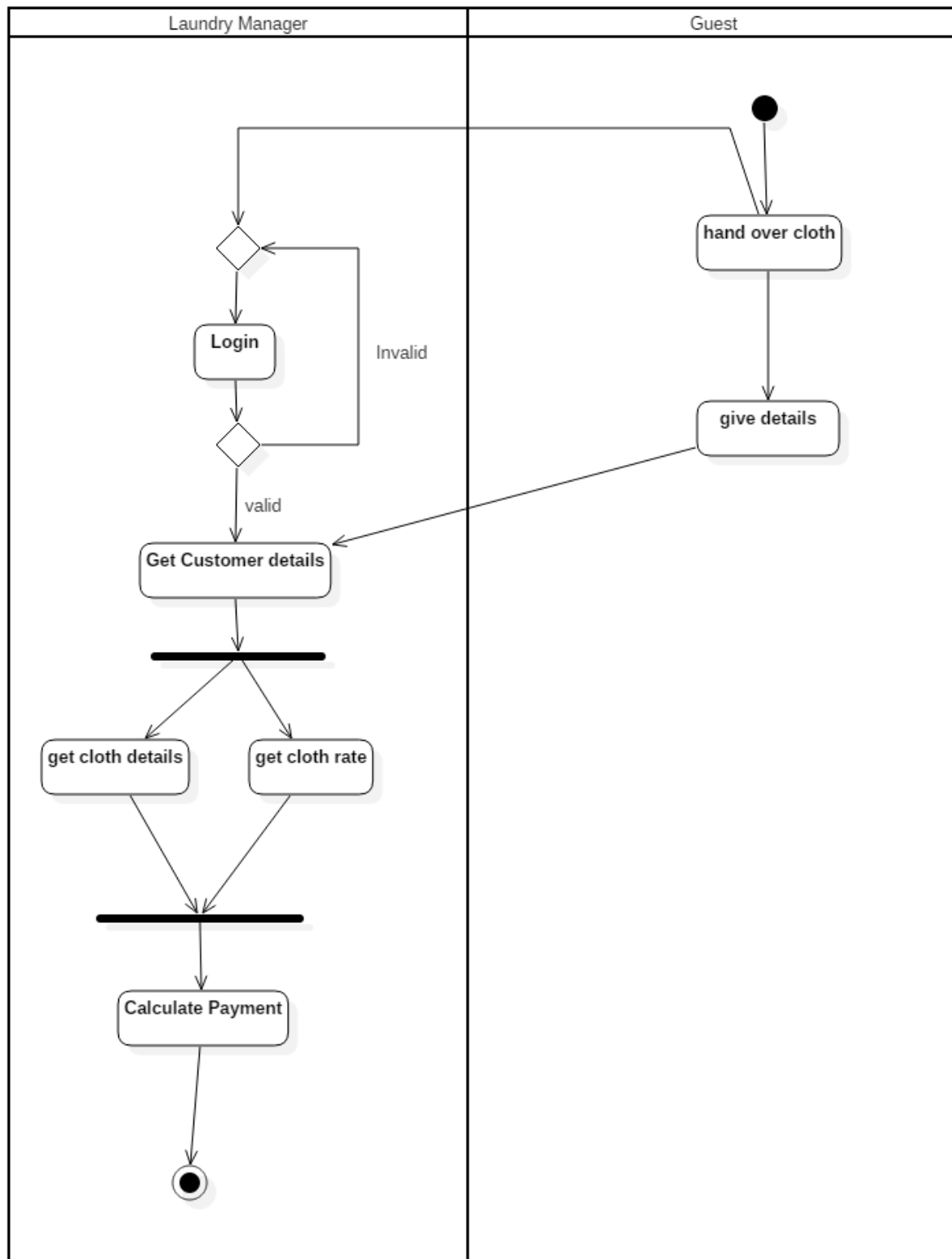


Figure 2.2.4 Laundry Management System Activity Diagram

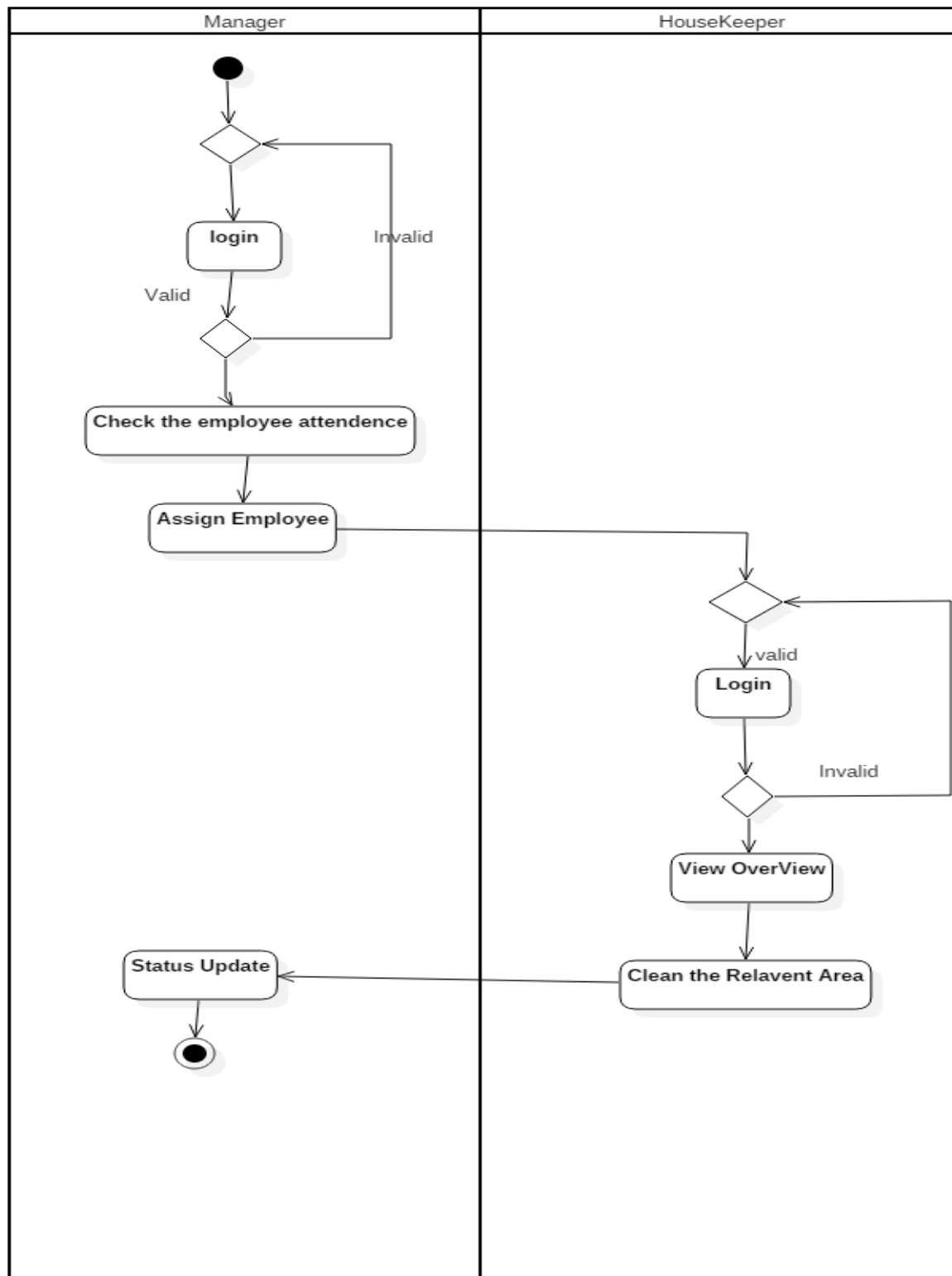


Figure 2.2.5 Housekeeping Activity Diagram

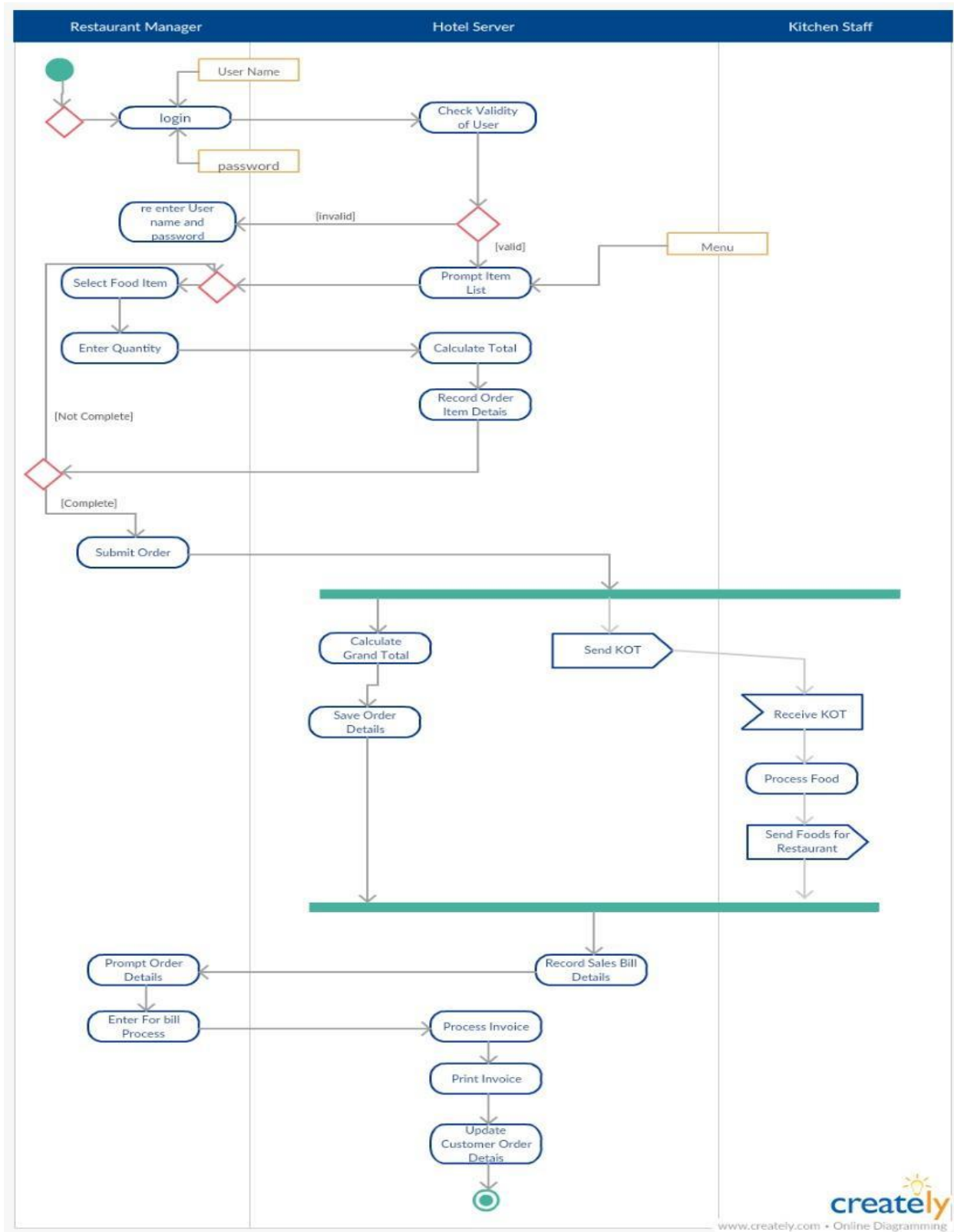


Figure 2.2.6 Restaurant Management Activity diagram

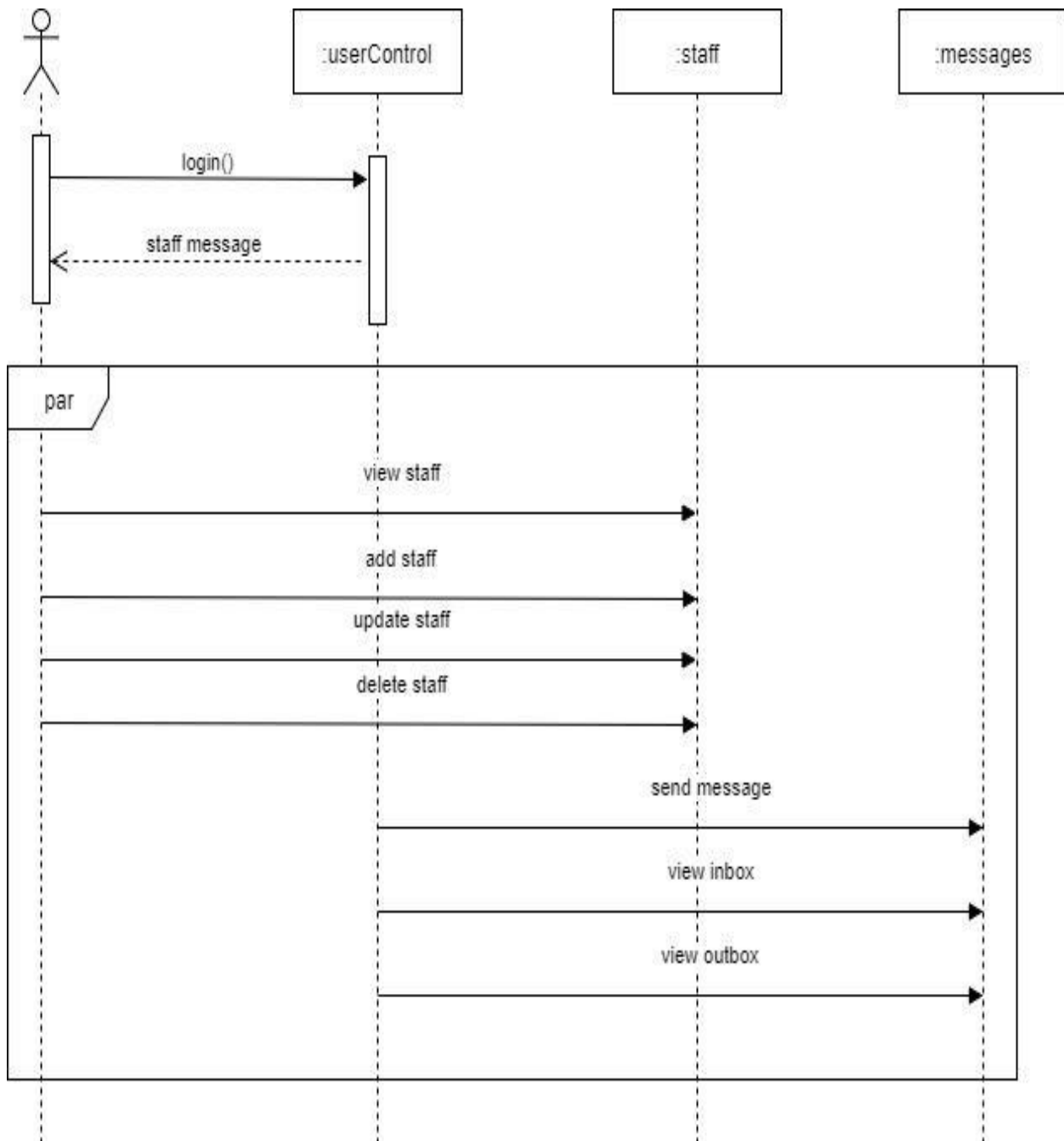


Figure 2.2.7 System and Employee Management System Sequence Diagram

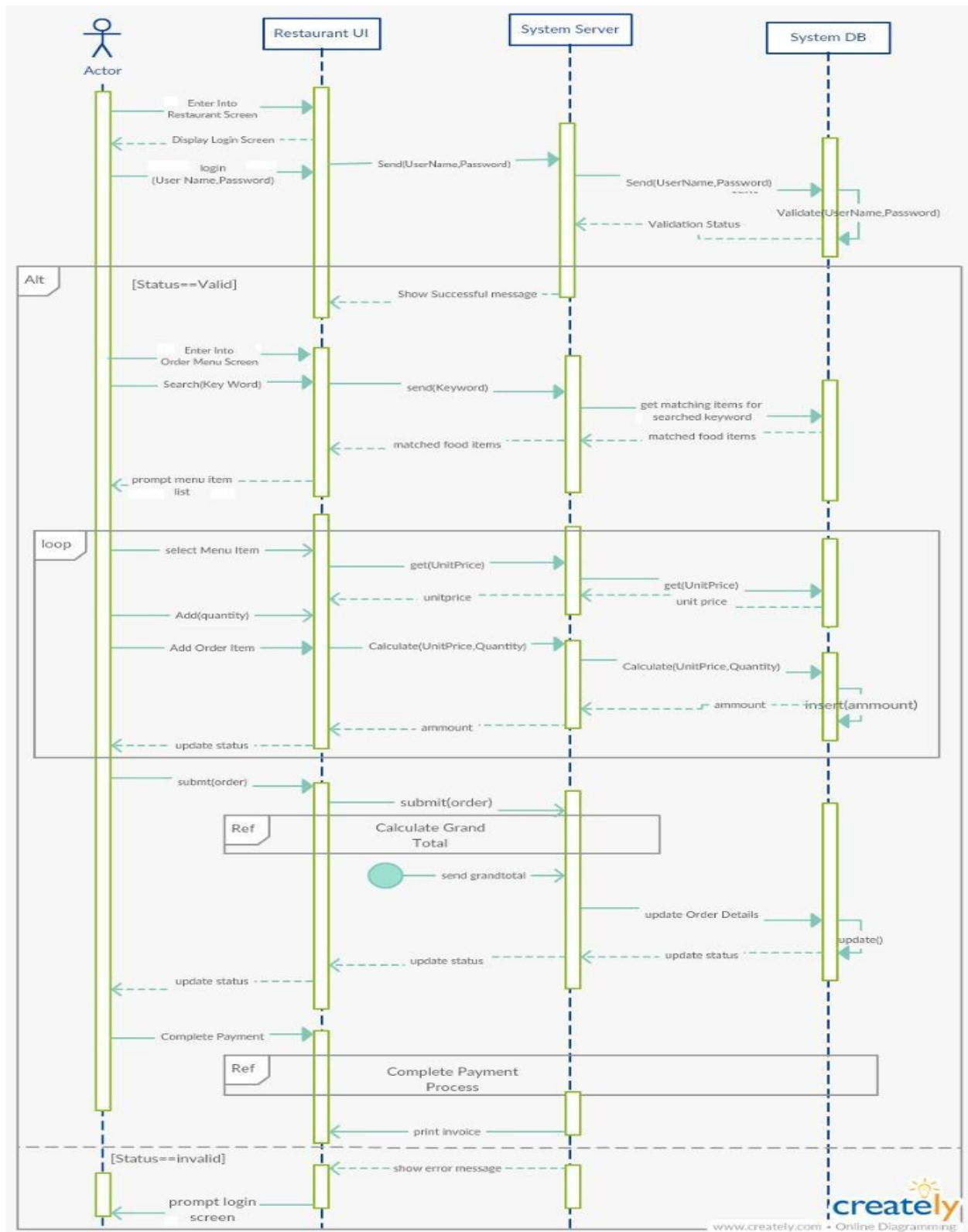


Figure 2.2.8 Restaurant Management Sequence Diagram

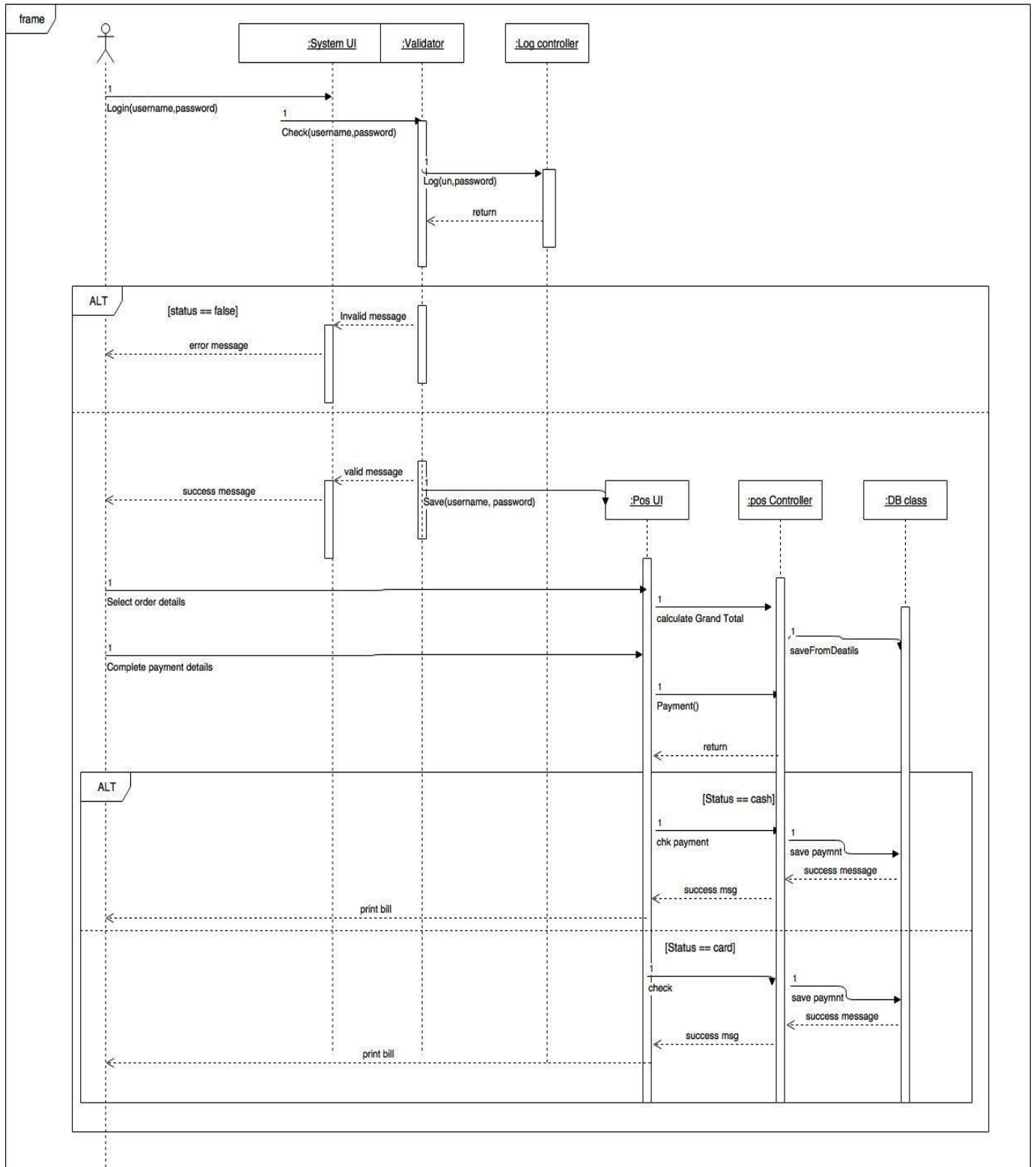


Figure 2.2.9 Bar Management System Sequence Diagram

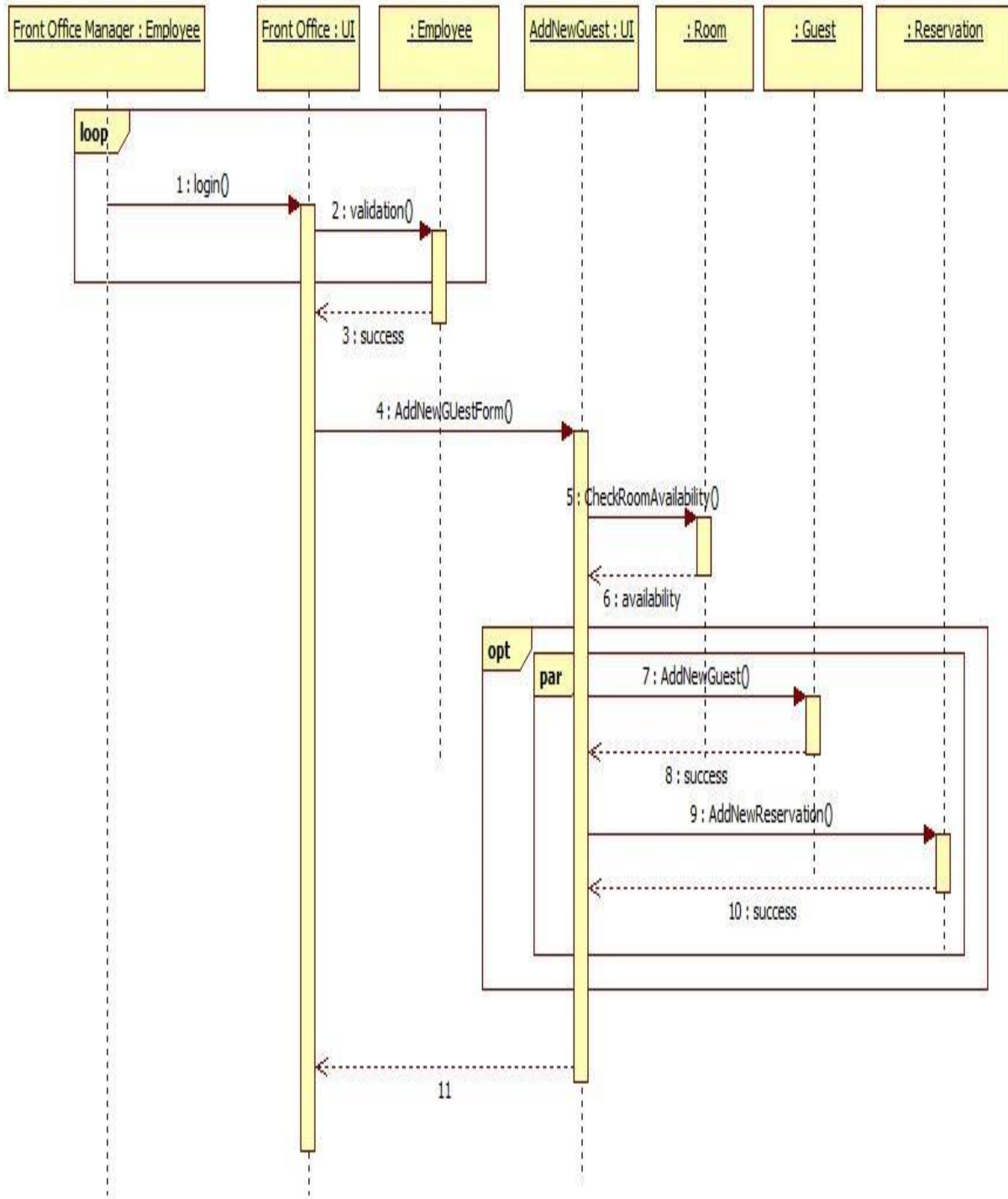


Figure 2.2.10 Front Office Management System Sequence Diagram





## 2.2 Non-Functional Requirements

- **Security**  
At the point when a staff member login to the framework, they should give valid username and password. Each level of clients had given diverse benefits as per organization requirements.
- **Usability**  
Because it has user-friendly interface. In that system every task show from message box task is success or not. So it make easy to use system.
- **Reliability**  
Unapproved individuals can't get to the system on the grounds that the system needs valid username and password. The unwavering quality of organization information is high.
- **Maintainability**  
Because of the documentation and programming constraints and followed through out the complete session it is easy to maintain the hotel management system.

## **3. Evaluation**

### **3.1 Assessment of the Project results**

The objectives set for this project were defined in the Introduction. As per that, the main objective for this entire project is to computerize and manage all the main functions of a hotel to make the activities to be carried out conveniently and efficiently. The main functions categorized as Inventory Management System, Finance Management System, Front Office Management System, Bar Management System, Housekeeping and Laundry Management System, Restaurant Management System, System and Employee Management System.

Each sub system carries out a separate unique objective to be fulfilled. To analyze each sub system's unique objective and the whole system's main objective the black box approaching couldn't be used or more like was not enough in analyzing query evaluation and framework evaluation

The results obtained by the analysis for certain scenarios were encouraging and demonstrated how as the system evolves the users of the system to get more clear idea about what's happening when they were using the system. But, however, the results regarding some cases explained that the system needs more complicated work than the others to get more efficient usage.

## 3.2 Lessons Learned

While doing this project a lot of valuable lessons were learned by us.

- It was understood by us as a team how to share the duties equally among us and perform them to our level best. Also realized that every individual in the project plays an important role for a team to achieve its goals successfully.
- Time management- this was one of the most crucial problems that we had to encounter. There were deadlines assigned to us and it was always important that the work was submitted beforehand.
- Developed coding skills in C# and learned to self-study with the help of online tutorials and video documentations.
- It was understood by us how huge IT projects are done in the industry and gained a vast experience in project management.

### **3.3 Future Work**

This project is going to be the first fully automated software that the client is going to use and if the hotel management decides to increase the usage of computers for their other tasks, the system is designed in way that it could adopt to changes. For the ease of the client we will be allowing them to upload CVS to the system so that it would increase the efficiency by reducing the amount of time used by the officers to input the data of the hotel to the system.

### **General Issues**

The security of the login of the system should be improved. Try to find a solution to integrate a system where the system is hacked or broken into by some other unauthorized persons, an automated warning should be sent to either to a phone or to email of the master administrative officer and the other sub-administrative officers.

For the case of programming language C# was chosen so that the future updates can be done without any much effort of understanding the language by, if any other parties tried to handle the system, as C# is an easiest programming language and widely in use.

And, if the customer required advanced software than what initially have been used, it can easily be done without any much effort.

## 4. Conclusion

Standalone solution for White Villa Resort has been a successful project, throughout the execution and in completion.

The team managed to incorporate most, if not all, of the requirements given by the hotel into the final product. The vivid realization of the final solution exceeded both the team's and the client's initial expectations. The combination of out-of-the-box thinking, hard work and perseverance made the team achieve such an amazing feat.

Time constraint on the project was the biggest limitation the team has faced. Although, for the given time, the team has successfully developed a fully functioning system with various nonfunctional requirements implemented with the intention of making a truly intuitive and user-friendly standalone application.

However, the system can be improved further by implementing performance improvements, better error handling, and fixes for various bugs that are yet to be discovered. Additional functionality can also be implemented in the future as the system is designed to be flexible and easily maintainable.

The experience the team has gained from working as a team as well as working with a client is immense. This project made the team gain confidence on working with the industry and acquires a great deal of information on following a software development life cycle model. The team also gained a higher level of expertise in both developing a software-based solution as well as in the world of business.

Each member of the team was responsible for the success of the project. The objectives achieved through collaboration and the collectively gained experience will pave the path for the team into a brighter future.





