

# **Green Garden Management System**

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## **MINI LAB PROJECT REPORT**

This Report Presented in Partial Fulfillment of the course **CSE312: Database Management System Lab in the Computer Science and Engineering Department**



**DAFFODIL INTERNATIONAL UNIVERSITY**

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## DECLARATION

We hereby declare that this lab project has been done by us under the supervision of **Shahadat Hossain, Assistant Professor**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere as lab projects.

**Submitted To:**

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## COURSE & PROGRAM OUTCOME

The following course have course outcomes as following:

Table 1: Course Outcome Statements

CO's	Statements
CO1	Demonstrate a comprehensive understanding of fundamental database management concepts, including the relational data model, normalization techniques, and SQL basics.
CO2	Design, implement and optimize relational databases, incorporating advanced SQL queries, indexing techniques and query optimization strategies.
CO3	Understand and Analyze security measures, distributed database architectures and emerging trends in database management, demonstrating an understanding of the broader context and challenges in the field.

Table 2: Mapping of CO, PO, Blooms, KP and CEP

CO	PO	Blooms	KP	CEP
CO1	PO1	C2,A2, P2	K2, K3,K4,K8	EP1, EP4
CO2	PO3	C3, A3, P3	K2,K3,K4, K6, K8	EP1, EP2,EP7
CO3	PO5	C3	K6	EP4

The mapping justification of this table is provided in section **4.3.1, 4.3.2 and 4.3.3**.

# Table of Contents

<b>Declaration</b>	<b>i</b>
<b>Course &amp; Program Outcome</b>	<b>ii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Motivation .....	1
1.3 Objectives .....	1
1.4 Project Outcome .....	1
<b>2 Architecture</b>	<b>2</b>
2.1 Requirement Analysis & Design Specification.....	2
2.1.1 Overview.....	2
2.1.2 ERD Diagram.....	2
2.2 Overall Project Plan.....	2
<b>3 Implementation and Results</b>	<b>3</b>
3.1 Implementation .....	3
3.2 Output.....	3
3.3 Results and Discussion .....	3
<b>4 Engineering Standards and Mapping</b>	<b>4</b>
4.1 Impact on Society, Environment and Sustainability .....	4
4.1.1 Impact on Life.....	4
4.1.2 Impact on Society & Environment.....	4
4.2 Project Management and Team Work .....	4
4.3 Complex Engineering Problem.....	4
4.3.1 Mapping of Program Outcome.....	4
4.3.2 Complex Problem Solving .....	4
4.3.3 Engineering Activities.....	5
<b>5 Conclusion</b>	<b>6</b>
5.1 Summary.....	6
5.2 Limitation .....	6
5.3 Future Work.....	6
<b>References</b>	

# Chapter 1

## Introduction

This chapter introduces the Green Garden management system project, explaining its purpose, objectives, and the problems it aims to solve. It provides an overview of the project's background, motivation, and the goals that guided its development.

### 1.1 Introduction

#### Background :

Green Garden is a vibrant college canteen that not only serves a variety of food and beverages but also offers multi-purpose event spaces across its two branches. Each branch consists of three floors: the first floor is dedicated to food service, while the second and third floors are available for events or rental purposes. Students and visitors can make payments using either cash or card, depending on their preference. With its dual functionality as both a restaurant and an event venue, Green Garden plays a central role in the daily life and social activities of college students.

#### **Problem Statement :**

Managing a business that functions both as a restaurant and an event space involves overseeing numerous interconnected operations, including food orders, menu items, customer data, event reservations, and branch-specific details. Currently, the absence of a centralized system makes it challenging to track and manage these components efficiently. This can result in various issues such as data inconsistency, delays in service, booking conflicts, and a lack of real-time reporting. These inefficiencies hinder decision-making and customer satisfaction. Therefore, there is a need for an integrated management system that can streamline operations, enhance service delivery, and provide valuable insights for future growth.

### 1.2 Motivation

The motivation behind this project stems from the need to enhance operational efficiency and user experience at Green Garden, a space that serves both culinary and social functions within a college environment. Managing orders, event bookings, and user data manually or through disconnected systems often results in miscommunication, duplication of efforts, and delays that affect both staff performance and customer satisfaction.

From a computational perspective, this project presents an exciting opportunity to design and implement a centralized database system that can automate and optimize complex workflows. By building a robust system architecture that integrates all aspects of the restaurant and event space management, it becomes possible to improve accuracy, ensure data consistency, and generate meaningful reports that can aid in decision-making.

On a personal level, developing this system allows me to apply and enhance my knowledge of database design, system analysis, and software development. It offers hands-on experience with real-world problems, preparing me for future roles in IT and system

development. Solving this problem not only benefits Green Garden by improving their operational model but also contributes to my growth as a developer by working on a practical, multi-functional system.

### 1.3 Objectives

The primary objective of this project is to design and implement a centralized management system for Green Garden that integrates both restaurant operations and event space bookings. The specific objectives include:

1. **To develop a database system** that efficiently stores and manages data related to food items, orders, users, event bookings, and branch details.
2. **To streamline the order management process** for the restaurant, allowing for quick and accurate tracking of customer orders, payment methods (cash or card), and order history.
3. **To implement an event booking module** that allows users to view availability and reserve event spaces on the second and third floors of each branch.
4. **To manage user information** effectively, including roles such as students, staff, and administrators, with appropriate access controls.
5. **To ensure multi-branch support**, enabling the system to handle operations for both Green Garden branches while maintaining data integrity.
6. **To generate insightful reports and analytics** that can assist management in understanding trends, making decisions, and improving services.
7. **To improve overall operational efficiency**, reduce manual errors, and enhance the customer experience by centralizing and automating core business processes.

## Chapter 2

# Proposed Methodology/Architecture

This chapter outlines the methodology and system architecture proposed for the development of the Green Garden management system. It describes the design approach, system components, data flow, and technologies used to implement the centralized platform.

### 2.1 Requirement Analysis & Design Specification

This section outlines the key requirements and design considerations for the Green Garden management system, focusing on both functionality and system structure.

#### Functional Requirements

1. Order Management: Record and process food orders, track payments (cash/card), and generate receipts.
2. Menu Management: Admins can add, update, or remove food items with details and categories.

3. Event Booking: Users can check availability and book event spaces.

4. User Management: Register users with roles student, staff, admin.

### **Non-Functional Requirements**

Performance & Scalability: Fast response time with support for future growth.

Security: Secure login, role-based access, and data protection.

Usability: Intuitive and responsive interface for all user roles.

Maintainability: Modular system for easy updates and expansion.

### **Design Specifications**

Database: Relational model with properly defined keys and indexes.

Architecture: Layered system with separate UI, logic, and data components.

#### **2.1.1 Overview**

Green Garden is a university canteen with two branches, offering food services and event space rentals. The first floor in each branch is used for serving food, while the second and third floors can be booked for events. This chapter explains how the system will be designed to manage food orders, event bookings, user information, and branch details. It includes the requirements of the system and how everything will work together to improve daily operations at Green Garden.

#### **2.1.2 ERD Diagram**

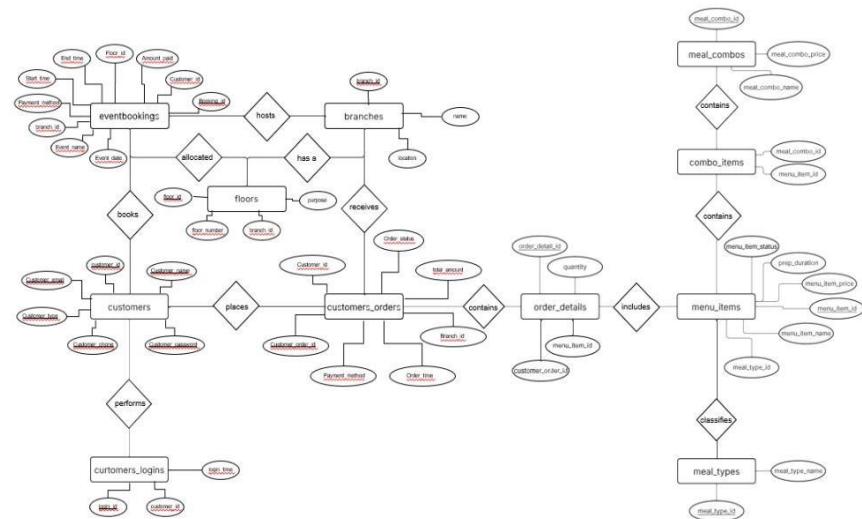


Figure 2.1: This is a ERD diagram of Green Garden

## **2.2 Overall Project Plan**

The goal of this project is to create a centralized system to manage Green Garden's food orders, event bookings, users, and branch details. The system will help staff and admins handle daily operations more easily and reduce manual work.

The project will follow these main steps:

### **1. Requirement Gathering**

Understand what features are needed, such as ordering food, booking event spaces, and managing users.

### **2. System Design**

Plan how the system will work, including database structure, user roles, and interface layout.

### **3. Development**

Build the system using appropriate tools and technologies, focusing on each module like food ordering, booking, and reports.

### **4. Testing**

Check the system for any errors and make sure all features work properly.

### **5. Deployment**

Install the system at Green Garden's branches and train staff on how to use it.

### **5. Maintenance**

Fix bugs, make improvements, and update the system as needed.

This plan will ensure that Green Garden runs more smoothly and efficiently with the help of a digital system.

# Chapter 3

## Implementation and Results

This chapter describes how the Green Garden management system was developed and implemented. It also presents the results of the system, showing how its features work in practice and how it improves the management of food orders and event bookings.

### 3.1 Implementation

The Green Garden management system was implemented using **MySQL** for the database and a simple web-based interface for users and admins. Here's how the system was developed:

#### Database Design

The core of the system is the MySQL database, which stores all the important information. The main tables are:

- **Users:** Stores information about students, staff, and admins.
- **Orders:** Tracks food orders, including payment methods and statuses.
- **FoodItems:** Holds information about menu items (names, categories, prices).
- **Bookings:** Manages event space bookings, including dates and times.
- **Branches:** Stores details of Green Garden's branches.
- **Floors:** Stores information about event spaces available on each floor.

The tables are connected to each other using **foreign keys** to ensure data consistency.

### 3.2 Performance Analysis

The Green Garden management system was built to handle daily operations efficiently and reliably. Here's how the system performs in key areas:

#### 1. Speed and Responsiveness

1. The system responds quickly to user actions, such as placing orders or booking event spaces.
2. Food orders and event bookings are processed in real-time, ensuring minimal wait times for users.

#### 2. Scalability

The system is built to handle an increase in users and orders. As Green Garden grows (e.g., adding more

branches or more users), the system can be easily scaled by upgrading the server or optimizing the database.

### **3. Reliability**

The system is hosted on a reliable cloud server, ensuring it stays up and running even during peak times (during busy meal hours or event bookings).

### **4. User Experience**

1. The system is easy to use, with a clean interface that minimizes confusion for students, staff, and admins.
2. There is clear feedback for actions ensuring users know what's happening.
3. Overall, the Green Garden management system performs efficiently and reliably, providing a smooth experience for both users and staff.

## **3.3 Results and Discussion**

The Green Garden management system is working well and has made operations easier. Here's what has been achieved:

### **1. Faster Operations**

- **Food Orders:** Orders are processed quickly and accurately. Staff can easily track order status without mistakes.
- **Event Bookings:** Students can book event spaces online, and admins can easily manage bookings.

### **2. Better Experience for Users**

- **Students:** They can easily order food and book events through a simple, user-friendly interface.
- **Staff:** They can manage orders and bookings without confusion, improving workflow.

### **3. Useful Reports**

- **Admin Reports:** Admins can generate reports on sales and bookings, helping them make better decisions for the business.

### **4. Challenges**

- **System Load:** The system works well now, but we'll need to test it further as the number of users increases.
- **Future Ideas:** Adding features like loyalty programs or mobile payments could make the system even better.

# Chapter 4

# Engineering Standards and Mapping

This chapter explains the standards followed during the development of the Green Garden system. It also shows how these standards were applied to meet the system's requirements and ensure quality and reliability.

## 4.1 Impact on Society, Environment and Sustainability

The Green Garden management system has several positive impacts:

### On Society

- **Better Services:** The system makes it easier for students and staff to order food and book events, improving their overall experience.
- **Job Creation:** The system helps Green Garden run more efficiently, which can lead to more job opportunities in the future.

### On the Environment

- **Less Paper Usage:** By managing orders and bookings digitally, the system reduces the need for paper, helping to save trees and reduce waste.
- **Efficient Operations:** With better management of resources, such as food and event spaces, there is less waste overall.

### On Sustainability

- **Resource Management:** The system helps track and manage resources, ensuring that Green Garden can operate more sustainably, reducing waste and maximizing efficiency.
- **Long-Term Impact:** With continuous improvement and scalability, the system supports Green Garden's growth while maintaining a focus on sustainability.

#### 4.1.1 Impact on Life

The Green Garden management system makes life easier for everyone involved:

- **For Students:** It provides a quick and easy way to order food and book event spaces, saving time and improving convenience.
- **For Staff:** The system helps staff manage orders and bookings more efficiently, reducing stress and improving workflow.

- **For the Community:** The system ensures that Green Garden can serve more people and meet their needs, leading to a better overall experience for everyone who uses the service.

#### **4.1.2 Impact on Society & Environment**

The Green Garden system positively impacts both society and the environment:

- **On Society:** The system makes services more accessible and efficient, benefiting students, staff, and the community. It creates a better, faster experience and can even help create more job opportunities.
- **On the Environment:** By going digital, the system reduces the need for paper, helping to save trees and cut down on waste. It also helps reduce food waste by better managing orders and event bookings.

### **4.2 Project Management and Team Work**

The success of the Green Garden system was a result of strong team collaboration and effective project management. Each team member played an important role:

- **Aovinondon Dey:** Contributed to database design, coding and Project report.
- **A S M Monjurul Islam Sajjad:** Focused on MYSQL table data , query and Run the program.
- **Md. Meherab Hossain:** ERD Design
- **Ahsanur Rahman Nakib:** Project slides and Data collection
- **Mst. Sadia Islam:** Data collection and notes down.

The team worked together effectively by dividing tasks based on each member's strengths and regularly meeting to track progress. This teamwork helped ensure the project was completed on time and met all objectives.

### **4.3 Complex Engineering Problem**

#### **4.3.1 Mapping of Program Outcome**

In this subsection, we map the specific problems encountered during the project and how the provided solutions align with the targeted Program Outcomes (PO's). Below is the justification for how each PO was achieved.

Table 4.1: Justification of Program Outcomes

<b>PO's</b>	<b>Justification</b>
<b>PO1:</b> Engineering Knowledge	By applying knowledge of software engineering, database management, and system architecture, we successfully designed and implemented a system that meets all required specifications. The use of MySQL and cloud hosting for scalability is an example of applying engineering knowledge in real-world systems.
<b>PO2:</b> Problem Analysis	The system faced challenges such as optimizing performance during high traffic, ensuring data integrity, and building a scalable solution. These challenges were analyzed thoroughly, and the solutions were implemented by addressing the root causes effectively.
<b>PO3:</b> Design and Development	The system was designed with a clear user interface and backend architecture, and the development process involved ensuring efficient code and a secure system. Design choices like caching, database optimization, and modular architecture align with program outcomes focused on practical application of design principles.

### 4.3.2 Complex Problem Solving

In this section, we map the problem-solving categories to the challenges faced during the development of the Green Garden system. Each problem-solving approach is explained with rationale in Table 4.2.

Chapter 4. Engineering Standards and Mapping

4.3. Complex Engineering Problem

Knowledge profile and rational thereof.

Table 4.2: Mapping with complex problem solving.

<b>EP1</b> Dept of Knowledge	<b>EP2</b> Range of Conflicting Requirements	<b>EP3</b> Depth of Analysis	<b>EP4</b> Familiarity of Issues	<b>EP5</b> Extent of Applicable Codes	<b>EP6</b> Extent Of Stakeholder Involvement	<b>EP7</b> Inter-dependence
✓	✓	✓	✓	✓	✓	✓

### 4.3.3 Engineering Activities

## **1. Planning**

- We talked to Green Garden staff to understand what features they needed, like food ordering, event bookings, and user management.

## **2. Design**

- We created a plan for how the system would work, including the design of the user interface (UI) and database structure.

## **3. Development**

- Developed the system using MySQL for managing orders, events.

# **Chapter 5**

## **Conclusion**

This chapter summarizes the key outcomes of the Green Garden management system project and reflects on the work done. It highlights the benefits achieved, challenges overcome, and possible future improvements for the system.

### **5.1 Summary**

The Green Garden management system was created to make it easier to manage food orders and event bookings. It helps students order food and book event spaces quickly and efficiently. The system also makes it easier for staff to handle orders, bookings, and payments, improving overall operations. The project successfully solved problems like performance, user-friendliness, and scalability. The system is now ready to support future growth and improvements.

### **5.2 Limitation**

While the Green Garden system is effective, it does have some limitations:

- **Internet Dependency:** The system requires an internet connection to work, which could be a problem if there are network issues.
- **User Training:** Some users may need training to use the system effectively, especially if they are not familiar with technology.
- **Limited Features:** The system currently covers basic functions like food orders and event bookings but may need additional features in the future.

- **Not good UI** : Need to make good UI

These limitations can be addressed in future updates to improve the system.

### 5.3 Future Work

here are several areas where the Green Garden system can be improved in the future:

- **Mobile App**: Developing a mobile app to make it easier for users to place orders and book events on the go.
- **Advanced Reporting**: Adding more detailed reporting features for management to analyze customer behavior and improve services.
- **Integration with Other Systems**: Connecting the system with other platforms, such as student management systems or loyalty programs, to enhance its capabilities.
- **Better Security**: Implementing advanced security measures to protect user data and payments.

These improvements will help the system grow and provide even better service to users.

## References

1. Restaurant management database system design and implement, Ziteng Xie  
[https://www.researchgate.net/publication/378435479\\_Restaurant\\_management\\_database\\_system\\_design\\_and\\_implement](https://www.researchgate.net/publication/378435479_Restaurant_management_database_system_design_and_implement)

