UNIVERSITY OF ECONOMICS AND LAW

FACULTY OF INFORMATION SYSTEMS

FINAL PROJECT REPORT

KODEE Net Cafe Service Management Software

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Additionally, we sincerely appreciate the students, faculty members, and internet cafe owners who participated in our surveys and provided insightful feedback during our research. Their contributions have helped us better understand the practical needs of users, allowing us to develop a more relevant and effective software solution.

Finally, we would like to extend our heartfelt thanks to all members of **Code Craziers** for their dedication, responsibility, and close collaboration throughout the project implementation.

COMMITMENT

Our team hereby certifies that all content presented in this report is the result of our original research and development efforts.

All data, figures, and analytical results contained in this report are based on rigorous experimentation, surveys, and research, with no unauthorized copying or plagiarism. Proper citations have been provided where necessary.

We take full responsibility for the accuracy and integrity of this report.

Group Code Craziers

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LIST OF ABBREVIATION

DB	Digital Business
MIS	Management Information Systems
GUI	Graphical User Interface
JSON	JavaScript Object Notation
XML	Extensible Markup Language
OOP	Object-Oriented Programming
LIFO	Last In, First Out

ABSTRACT

The rapid growth of internet cafes and gaming centers has significantly increased the demand for modern, automated, and efficient management systems. The KODEE Net Cafe Service Management software, developed by the Code Craziers team, aims to provide a comprehensive solution for managing internet cafe operations, including customer management, service payments, revenue tracking, and employee shift management.

The software is built on the Python and PyQt platform, offering a user-friendly and intuitive interface. Its key features include service booking, real-time session monitoring, food and beverage menu management, employee shift control, and automated revenue reports. The system also supports data synchronization and automatic billing calculations, minimizing operational errors.

However, the current version has some limitations, such as the lack of web and mobile support, absence of integrated online payment gateways, and limited data analytics capabilities. To address these issues, we propose future enhancements, including developing a web/mobile version, integrating artificial intelligence (AI) for customer behavior analysis and revenue optimization, implementing online payment systems, and enhancing data security.

With these advancements, KODEE Net Cafe Service Management is expected to become an intelligent internet cafe management platform, optimizing business processes and delivering an enhanced experience for both managers and customers.

CONTENT

Chapter 1: Project Overview

1.1. Research Objectives

1.1.1. Reasons for Research

The diversity and expansion of internet cafe models are increasing. With this strong development, the project aims to develop a management system for internet cafes, helping employees to track customer activities on computers based on each customer's information. This not only helps employees easily manage their work but also ensures that each customer receives the best service and is suitable for their needs.

This system is designed to record and track customer activities on each computer, including software usage, working time, games or applications that customers access, thereby providing a clear view of customer habits and needs. Thanks to that, employees can support customers more effectively, while optimizing the management of cafe resources such as computers, tables, chairs and other equipment. This also helps cafe managers easily track the services customers use and prepare resources reasonably.

In addition, this application also integrates other convenient services to enhance convenience and comfort for customers. Specifically, customers can adjust factors such as space temperature through the air conditioning system connected to the software. They can also directly order food and drinks from the restaurant's menu without having to call the staff, all of which are easily done through the software interface. This not only saves time for customers but also reduces work pressure for service staff.

The system is also designed to connect with other services such as electronic payment, helping customers pay bills quickly and easily without having to worry about carrying cash or credit cards. These features not only bring convenience to customers but also help the restaurant increase its ability to serve more quickly and effectively.

Overall, this management system not only benefits employees in monitoring and managing activities in the shop, but also helps improve customer experience through convenience, efficiency and ease of use. Internet cafe managers will have a comprehensive view of business operations and service efficiency, from which they can make decisions to adjust and develop better services.

1.1.2. Reasons for Using PyQt

PyQt was chosen for this project due to its minimalist graphical interface and robust functionality since it provides a flexible and professional GUI design experience, compatible with multiple platforms, especially PyCharm. Moreover, there is also seamless integration with Python, enabling the use of data analysis and AI/ML libraries like Pandas, NumPy, and TensorFlow. PyQt has the ability to offer high performance and flexibility, offering powerful tools for event handling and multithreading, ensuring smooth operation even with a large number of users. Finally, with its ability to create expansion support with C++, PyQt can allow performance optimization when necessary.

1.2. Research Scope

In this project, selecting the right tools plays a crucial role in system development and deployment. The primary programming language is Python, a powerful and widely used language, particularly suitable for GUI applications, data processing, and automation. To build the user interface, PyQt, a Qt-based toolkit, is utilized for developing intuitive, visually appealing, and feature-rich applications. PyCharm serves as the primary integrated development environment (IDE) for coding, project management, and debugging, increasing efficiency and ensuring code consistency. Additionally, Qt Designer is employed for GUI design using a drag-and-drop approach, simplifying the development process by converting graphical layouts into Python code with pyuic. This combination of tools ensures flexible development, optimized performance, and an enhanced user experience.

1.2.1. Tools Used in the Project

In order to ensure optimal performance and ease of development, the project incorporates several tools. We chose Python as our main programming language since it is a high-level language known for its simplicity, flexibility, and strong ecosystem of libraries for GUI development and data processing. PyQt, a powerful graphical user interface (GUI) library, enables the creation of cross-platform applications with rich UI elements. PyCharm serves as the integrated development environment (IDE), providing efficient tools for writing, managing, and debugging code, along with built-in support for PyQt and version control. Additionally, Qt Designer is utilized as a visual design tool, allowing developers to create UI layouts through a drag-and-drop interface, which can then be converted into Python code using PyUIC. This combination of tools ensures a streamlined development process, enhanced efficiency, and a robust final application.

1.2.2. Effectiveness Evaluation

PyQt was chosen for this project because of its minimalistic graphical interface and the powerful features it provides. PyQt not only provides a flexible and professional GUI design experience, but is also compatible with many different platforms, especially PyCharm, a powerful development tool. This makes it easy for developers to integrate and work efficiently in the software development environment, while minimizing compatibility issues when deploying on different operating systems.

A major advantage of PyQt is its seamless integration with Python, a popular programming language used in many fields, especially in data analysis and AI/ML technologies. With PyQt, powerful libraries such as Pandas, NumPy, and TensorFlow can be easily integrated, making the software not only meet the user interface requirements but also support efficient data analysis and processing. This is important in applications that need to process large amounts of data and implement machine learning or deep learning algorithms, as PyQt provides a solid foundation for incorporating powerful analytical and computational tools.

PyQt not only ensures high performance, but is also flexible in handling events and multi-threading, allowing the software to run smoothly even when multiple users are using it at the same time. This ability to handle multi-tasking is important in applications that require quick response and data synchronization between different modules of the system. In particular, PyQt supports the creation and management of threads to handle heavy tasks without affecting the user experience, helping the software maintain stability and performance even under high load conditions.

Finally, one of the great advantages of PyQt is the ability to scale performance when needed through integration with C++. This allows for optimization of the software's performance in situations that require large computational resources or when the system needs to process faster. The combination of Python and C++ provides great flexibility, allowing developers to tweak and optimize the software as needed, while maintaining the ease of extending and maintaining the project in the long term.

For all of these reasons, PyQt not only meets the requirements of the software's user interface and performance, but also provides the flexibility needed to integrate advanced features such as data analytics and AI processing, ensuring that the project can expand and grow over time without running into performance or scalability issues.1.3. Report Structure

This report consists of several chapters, each addressing a key aspect of the project.

1.3.1. Chapter 1: Literature review

Chapter 2 provides a theoretical foundation for the project by exploring essential programming concepts, including data structures and object-oriented programming, which are crucial for building scalable and maintainable applications. It also covers advanced GUI development in PyCharm, focusing on the integration of PyUIC and Qt Designer for efficient UI creation, along with an overview of key Python libraries like Pandas, NumPy, and TensorFlow for data handling and AI integration.

1.3.2. Chapter 2: Project Overview

This chapter introduces the project's objectives and research motivations, explaining why an advanced internet café management system is needed and why PyQt is the preferred technology.

1.3.3. Chapter 3: Research Methodology

This chapter outlines the research methodology, detailing the system analysis process, which evaluates existing internet café management solutions to identify areas for improvement. It also describes the iterative development cycle, from initial design to final implementation, and presents the testing strategies used to ensure the system operates correctly and efficiently.

1.3.4. Chapter 4: System Functionality Specification

In this chapter, we specify the system's functionalities, starting with hardware and software requirements necessary for optimal performance. It then elaborates on core system features, such as user authentication, session monitoring, and service requests, as well as extended functionalities, including automated billing, real-time notifications, and multi-device compatibility.

1.3.5. Chapter 5: System Implementation

This chapter delves into the system implementation, detailing the development tools and technologies used, including PyQt, Python, and database integration. It further explains the deployment process, covering steps from local development to live implementation, and discusses security considerations to ensure data protection and system integrity.

1.3.6. Chapter 6: Application Interface

Finally, Chapter 6 describes the application's graphical user interface, providing an overview of screen layouts, key interface elements, and their functionalities. It outlines the user interaction flow, demonstrating how customers and staff engage with the system, and includes detailed explanations of buttons, menus, and integrated services. This structured approach ensures a comprehensive understanding of the project, from its conceptualization to deployment and evaluation.

Chapter 2: Literature Review

Before delving into the specifics of the team's project, it is essential to establish a solid foundation by exploring key concepts and methodologies. This chapter provides a comprehensive overview of fundamental topics relevant to the project, ensuring a deeper understanding of its core components.

2.1. Overview of Functions and Their Processing in Python

A function in Python is a reusable block of code designed to perform a specific task. Python supports two primary function types: built-in library functions, which require importing, and user-defined functions, created using the def keyword. Functions may accept parameters and return values to enhance modularity and efficiency.

Python employs variable scoping to manage data visibility within functions. Local variables exist only within the function that defines them, whereas global variables are accessible throughout the program. Additionally, Python supports default arguments, allowing functions to be called with optional parameters. Lambda functions provide a concise way to define small, anonymous functions, often used for inline operations.

Recursion, where a function calls itself, is a powerful problem-solving technique in Python. However, it requires a base case to prevent infinite loops. Python follows the Last In, First Out (LIFO) principle for function execution, handling nested calls efficiently. Developers can enhance readability and maintainability by incorporating docstrings, which provide built-in documentation for functions.

2.2. Data Structures in Python

Understanding data structures is fundamental to efficient programming. Python provides several built-in data structures, each tailored for specific use cases.

Python offers robust string manipulation capabilities with methods like upper(), lower(), strip(), replace(), find(), split(), and join(), making text processing highly flexible.

Lists are dynamic data structures that allow modification, including adding, removing, sorting, and searching elements.

Similar to lists but immutable, tuples ensure data integrity by preventing modification after creation.

Unordered collections that do not permit duplicates, supporting operations like union, intersection, and difference.

About the dictionary, key-value pairs providing fast data retrieval, ideal for structured data storage.

To sum up, each of these structures plays a vital role in handling and manipulating data effectively within Python programs.

2.3. Object-Oriented Programming (OOP) in Python

OOP is a programming paradigm that enhances code organization and scalability. In Python, classes define blueprints for objects, encapsulating attributes and methods. Objects are instances of classes, with unique properties and behaviors.

Key OOP principles include, firstly, encapsulation, which restricts direct access to an object's data by defining access levels—public, private, and protected. This principle enhances security and modularity, ensuring that object attributes and methods are accessed and modified only through controlled mechanisms.

Inheritance allows subclasses to inherit and reuse attributes and methods from a parent class, reducing redundancy and promoting code reusability. It facilitates hierarchical relationships, enabling efficient extension of existing functionality without modifying the original code.

Polymorphism enables methods to perform different tasks based on the object that invokes them. It supports method overriding and dynamic method dispatch, allowing seamless interaction between different class types while maintaining a consistent interface.

Method overloading and overriding provide additional flexibility in function behavior. Overloading allows multiple function definitions with different parameters, improving adaptability in function calls. Overriding enables subclasses to redefine inherited methods, ensuring that specific behaviors are tailored to individual class requirements while maintaining structural integrity.

Garbage collection is Python's automatic memory management system that identifies and deallocates unused objects, optimizing performance and preventing memory leaks. This built-in feature enhances efficiency by reclaiming resources no longer needed by the program.

2.4. File Handling in Python

File processing is crucial for data storage and retrieval. Python supports multiple file formats, each suited for different use cases.

Text files are handled using the open(), read(), and write() functions, with modes such as r (read), w (write), and a (append). These files are commonly used for storing and processing plain text data.

JSON files are widely used for structured data exchange, managed through Python's built-in json module. JSON's lightweight format makes it ideal for web applications, APIs, and data serialization.

Excel files are processed using the pandas library, which provides powerful data manipulation capabilities. This format is useful for handling tabular data, performing statistical analysis, and integrating with spreadsheet software.

Pickle files enable the binary storage of Python objects, allowing efficient serialization and deserialization. This format is particularly useful for storing complex data structures like dictionaries, lists, and custom objects.

XML files are managed using the xml.etree.ElementTree module, which supports hierarchical data representation. XML is commonly used for configuration files, structured documents, and web services.

Efficient file handling techniques, including buffered reading and writing, play a crucial role in optimizing performance and ensuring reliability in data-driven applications.

2.5. Advanced Graphical User Interface (GUI) Design

User-friendly GUIs improve application usability. Python offers multiple frameworks for GUI development, with PyQt6 and Tkinter being the most prominent.

We chose PyQt6 for its comprehensive widget set, advanced event handling, and seamless integration with databases. Qt Designer simplifies UI creation, allowing for a visual approach to designing interfaces, while PyInstaller aids in deployment by packaging applications into standalone executables.

Tkinter provides a more lightweight alternative with basic widgets such as labels, entry fields, buttons, and list boxes. Layouts can be managed using the pack(), grid(), and place() functions, making it suitable for simpler applications and rapid prototyping.

Design principles such as consistency, intuitive navigation, real-time feedback, and accessibility ensure efficient and inclusive GUI development. A well-structured interface enhances user experience by reducing cognitive load, preventing errors, and accommodating users with varying levels of technical expertise.

2.6. Essential Python Libraries

Python’s extensive library ecosystem accelerates development, providing tools for various computational and analytical tasks.

NumPy supports numerical computing with efficient array operations, making it essential for scientific computing and data analysis. It offers a powerful N-dimensional array object and optimized mathematical functions.

Pandas facilitates data manipulation and analysis using DataFrame structures. It simplifies handling structured data, enabling operations like filtering, grouping, and merging, which are crucial for data-driven applications.

Matplotlib and Seaborn enable data visualization for statistical insights. Matplotlib provides fine-grained control over plots, while Seaborn simplifies the creation of aesthetically pleasing statistical graphics.

The Random module generates random numbers for simulations and cryptography, playing a critical role in statistical sampling, testing, and secure encryption methods.

Custom libraries can be created by packaging reusable modules and distributing them using pip. Integrating libraries like Matplotlib with PyQt6 allows for dynamic data visualization within applications, enhancing interactivity and user experience.

By mastering these libraries, developers can build powerful, efficient, and scalable Python applications, equipping them to tackle real-world challenges with confidence and precision.

Chapter 3: Research Methodology

3.1. System Analysis

Before initiating the development of the KODEE Net Cafe Service Management Software, a comprehensive system analysis was conducted to identify existing limitations and to establish clear objectives for the new solution. This analytical phase involved in-depth interviews with internet café staff and managers, coupled with a critical review of currently available management software. It became evident that while many existing systems addressed basic functionalities, they often fell short in areas such as dynamic revenue analytics, real-time shift scheduling, and effective session tracking. These shortcomings highlighted the necessity for a more robust system that not only streamlined day-to-day operations but also empowered management with accurate, real-time insights for strategic decision-making.

The analysis revealed that the new system must integrate an intuitive and user-friendly front end with a resilient back-end architecture capable of handling large volumes of transaction data securely. Additionally, the ability to visualize financial performance through dynamic charts and reports was identified as a crucial requirement. Real-time synchronization of data between employee and manager interfaces would further enhance operational efficiency and decision-making capabilities.

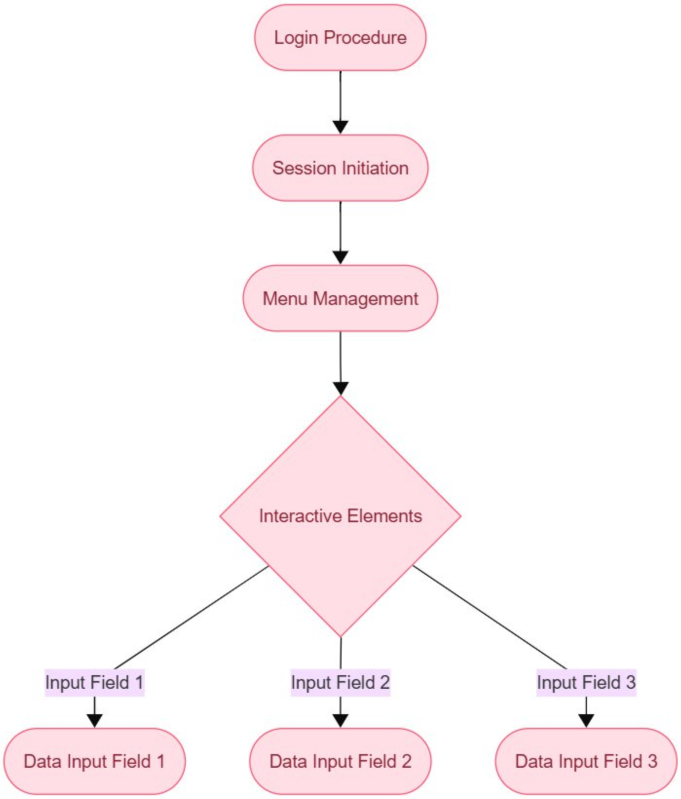


Figure 3.1. Conceptual Design Overview

3.2 Development Process

The software development process is built on an iterative cycle, emphasizing continuous improvement and adaptive adjustments based on user feedback throughout the process. In the first phase, a thorough requirements analysis was conducted to capture the detailed needs of the target users. The information gathered from in-depth discussions with employees and managers played a key role in shaping the functional priorities of the project.

One of the most important elements in the development process was the design of a role-based access system, ensuring that managers and employees have the right to access and edit data appropriate to their jobs. This not only increases work flexibility but also ensures data security. To achieve this, the system needs to have strong security mechanisms, including user authentication and data encryption.

Throughout the development process, the development team applied object-oriented design principles to ensure that the software can be easily maintained and extended in the future. These principles help the team ensure that the software can adapt and expand when there are changes in requirements and working environments, while minimizing problems during maintenance.

The user interface design phase was carried out using the Qt Designer tool, where the design team focused on building an interface that is both beautiful and easy to use, so that users can interact effectively with the system. One of the highlights of this phase was the choice of a consistent color palette and clear labels for interface elements, making it easy for users to identify and manipulate. Elements such as input validation and error messages were also applied to minimize errors during the data entry process.

Once the interface design was finalized, the formal programming phase began, using Python combined with PyQt to develop a feature-rich and high-performance application. Core modules such as secure login management, real-time session updates, and detailed revenue tracking were implemented, focusing on system reliability and performance. Each part of the software was built so that it could be easily updated or replaced without affecting the rest of the system, which helped ensure the long-term sustainability of the software.

In addition, the development team also focused on building a system architecture so that each component could easily interact with each other, ensuring that data was always synchronized and accurate across all interfaces and functions. The system was designed not only to handle current requirements but also to prepare for future expansion, as needs and scale of operations may change.

To enhance the software's efficiency, features such as real-time data analysis and automatic revenue reporting are also integrated. This allows managers to monitor business performance accurately and promptly, thereby making sound strategic decisions. These features not only improve work productivity but also create a seamless user experience, helping employees and managers work more efficiently.

In summary, the development process of KODEE Net Cafe Service Management software was built with the goal of developing a flexible, easy-to-maintain and scalable system in the future. The iterative development method, combined with collecting feedback from users, has helped the software meet the actual needs and improve the work performance of employees and managers in Internet cafes.

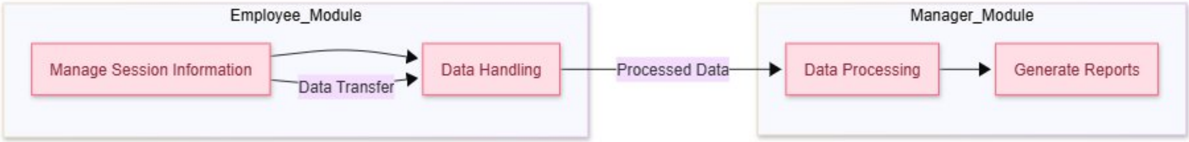


Figure 3.2. Data Flow Between Employee and Manager Modules

3.3 Testing Strategy

Testing plays a vital role in ensuring that the software meets all the standards of reliability and performance. To achieve this goal, a comprehensive testing strategy is implemented, including different levels of testing to ensure that each component of the software as well as the overall system is performing optimally. Through thorough testing, the development team is able to detect and address issues at an early stage, thereby minimizing the occurrence of problems when the software is put into actual operation.

Unit Testing

Unit testing is the first step in the testing process, ensuring that each component of the software functions correctly independently. Important modules such as user authentication module and session management processes are tested separately to ensure that each part of the system performs its function correctly. This helps the development team confirm that the basic functions of the software, such as logging in, checking access, and starting a session, work as expected.

During unit testing, the development team pays special attention to testing edge cases. These are situations that can occur under special or unusual conditions that a user might create, such as invalid input or an operation that exceeds limits. These cases are important because they can expose system errors that are not easily noticed in normal usage scenarios. Therefore, handling edge cases well will help the system operate more stably and accurately.

Integration Testing

After unit testing, integration testing is performed to check the interactions between modules and ensure that they work seamlessly when combined. One of the main goals of integration testing is to ensure that communication between the employee interface and the management backend is smooth, allowing for real-time data synchronization. This is important because accurate and timely data visualization and status updates help managers make better decisions and improve employee performance.

During this process, the testing team places special emphasis on verifying that changes in user activity are accurately reflected in the data analysis results. These changes may include updates to session information, revenue, or other important data, all of which need to be reflected quickly and accurately on the manager and user interfaces.

Performance Testing

Performance testing is an integral part of any testing strategy, especially for applications that have a large number of users or handle a lot of data. The development team conducted rigorous stress tests, simulating high-traffic situations, to check whether the system maintains good responsiveness under heavy load conditions. These tests help determine the scalability and stability of the system in situations with high user volume, such as during peak hours of the internet cafe.

During the performance testing, the team also focused on optimizing memory and database queries to minimize latency. This is an important factor because slow or interrupted operations during the use of the software can cause discomfort to users and reduce work performance. Therefore, optimizing memory and data queries helps improve the user experience and ensures that the system always meets performance requirements in all situations.

User Acceptance Testing

User Acceptance Testing (UAT) is performed at the end of the testing process to ensure that the software fully meets the needs and requirements of the end users. During this phase, actual managers and employees of the internet cafe are invited to participate in the software testing process in realistic simulation scenarios. This is an important step to confirm that the software not only functions correctly but also meets the expectations of users in a real environment.

Feedback from users is a decisive factor in the software improvement process. The comments from managers and employees help the development team to identify shortcomings or improvements that can be made to make the software run smoother and more user-friendly. Collecting and analyzing this feedback not only ensures that the final software will bring high user satisfaction but also creates a more reliable product, which increases confidence in the final result.

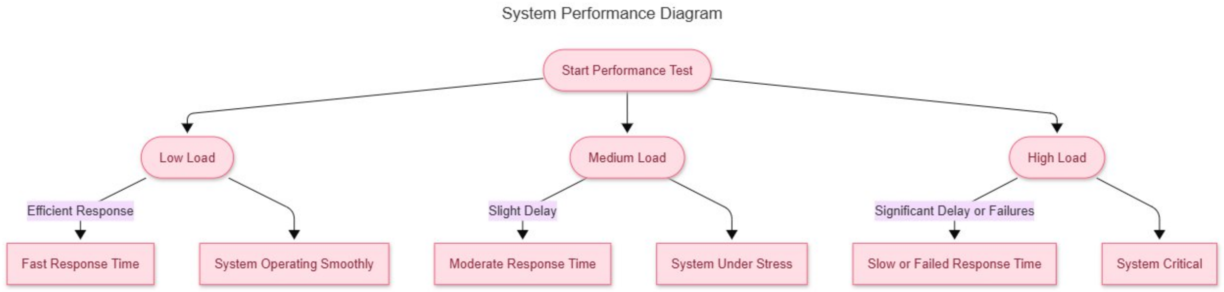


Figure 3.3. *Results of the performance test.*

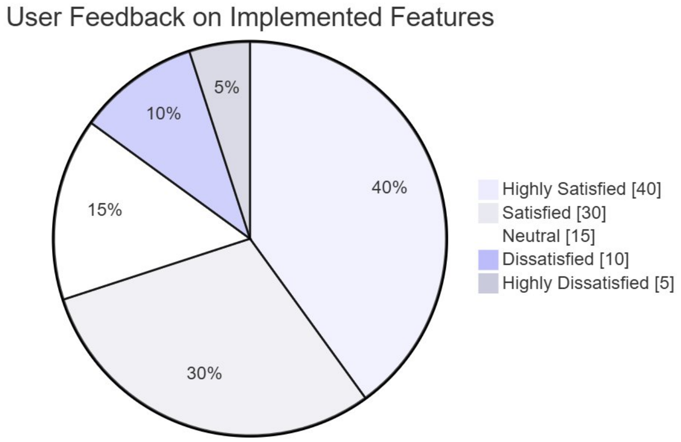


Figure 3.4. The success rate and satisfaction levels of the implemented features.

3.4 Tools and Technologies

The technological backbone of the KODEE Net Cafe Service Management Software was carefully chosen to ensure both robustness and flexibility. Python was selected as the primary programming language due to its versatility and expansive ecosystem, which supports rapid development and rich data analytics.

The decision to build the graphical user interface using PyQt, complemented by the design capabilities of Qt Designer, was guided by the need for a visually coherent and easily navigable user experience. This combination also allowed for rapid iteration during the design phase, making adjustments more intuitive and efficient. The modular structure of PyQt further facilitated the implementation of reusable components, ensuring maintainability.

Development was largely centralized within the PyCharm integrated development environment (IDE), which provided essential features such as integrated debugging, version control, and project management capabilities. Efficient collaboration was supported through Git for version control, allowing seamless integration of code contributions from different team members.

For persistent data storage, SQLite was the preferred database management system owing to its lightweight nature and robust performance. Its simplicity made it particularly suitable for storing employee records, transaction logs, and session details. Data security was further enhanced using encryption algorithms to protect sensitive information.

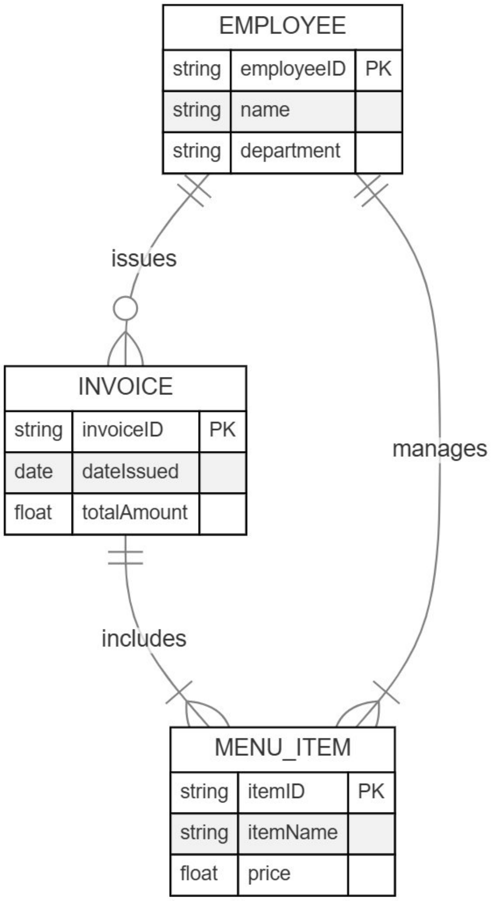


Figure 3.5. Schematic of the database design

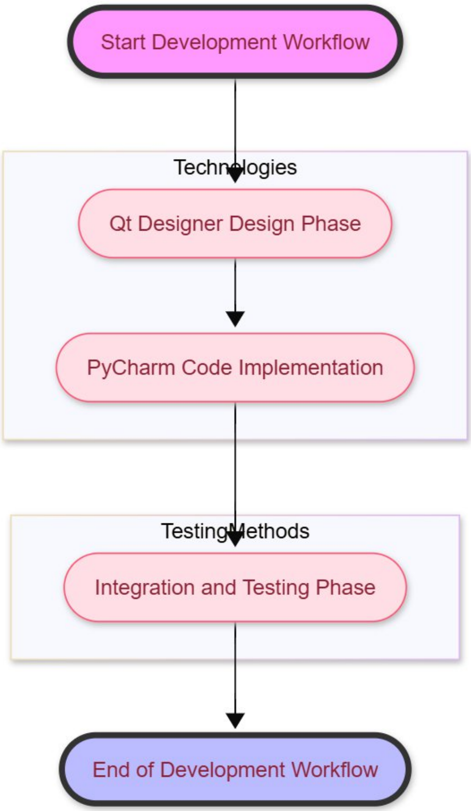

Start Development Workflow
Technologies
Qt Designer Design Phase
PyCharm Code Implementation
TestingMethods
Integration and Testing Phase
End of Development Workflow

Figure 3.6. Development workflow within PyCharm.

This image illustrates the software development process from the initial design in Qt Designer, through the actual code implementation, to the final testing steps. This process illustrates the tight integration of mature and modern technologies, ensuring that the system not only meets the requirements of efficiency and stability, but is also designed to be flexible for future expansion. These technologies have made it easy for the system to adapt and grow with the operational requirements of modern internet cafes, where factors such as speed, load capacity, and continuity of operation are very important.

Through the integration of powerful graphical interface design tools such as Qt Designer and the source code programming process with PyQt, we have built a software system that can seamlessly interact between the application components, from the user interface to the back-end modules. This ensures that when users interact with the system, their experience is smooth, intuitive, and free of performance or stability issues.

In addition to designing an easy-to-use user interface, the system is also optimized for multitasking, allowing the software to operate efficiently even when handling large numbers of users and data in an internet cafe environment. This is especially important when activities such as payments, food ordering, and tracking the number of computers in use need to be updated continuously and synchronized in real time.

In short, our development approach has been meticulously and systematically built to combine detailed analysis, continuous and adaptive development processes, rigorous testing procedures, and the application of advanced tools and technologies. This helps ensure that the software not only fully meets the current requirements of internet cafes, but can also be easily expanded and improved in the future, helping internet cafe managers and staff to manage more effectively, while enhancing service capabilities and customer satisfaction.

Chapter 4: Software Interface Mockup

4.1. Introduction

This project was developed to create a comprehensive management and operation software system for internet cafes, providing a solution for managing various activities in a cafe environment, including shift management, invoices, food and beverage menus, as well as revenue tracking. The goal of the software is to improve management processes in internet cafes, helping to increase employee productivity while providing managers with an overview and details of business operations. The software is designed with a friendly user interface, easy for all types of users, from employees to managers, to use conveniently and effectively.

In this project, the system is divided into two main roles: Employee and Manager, with each role having access to different features designed to suit their specific tasks. Specifically, staff can log into the system to manage orders, select machines for customers to use, process payment details and track the status of customer sessions. This helps staff save time and effort in serving customers, while ensuring accuracy and efficiency in daily transactions.

On the other hand, managers have access to high-level data, including revenue, number of employees, number of dishes and drinks sold, along with invoice information, giving them a clear view of the business performance of the restaurant. This data supports managers in making the right business decisions, thereby helping to improve the restaurant's operations and optimize financial, human resources and service management strategies.

The system is built with the goal of being easy to use and flexible, ensuring that employees and managers can operate quickly and accurately. The clear division of rights and functions between roles also helps secure and protect important data, while improving work efficiency for both groups of users. The revenue tracking function and detailed financial reports help managers grasp the business situation in a timely manner, thereby being able to make appropriate adjustments.

In general, this software is not simply a tool to support work, but also a comprehensive solution to help improve management and operation efficiency for internet cafes. This software also integrates detailed management features such as:

Statistic Dashboard: Having an overall review of the revenue, figures of other sales such as orders, food, …

Shift Management: Managing employee schedules and overseeing work performance.

Menu Management: Allowing easy updates to food and beverage menus, enabling the café to adjust its offerings according to customer preferences.

Invoice Management: Helping track paid invoices and providing detailed information about each transaction.

In particular, the software integrates features to track and analyze the café's revenue. Managers can easily view total daily revenue and analyze revenue by shift (morning, afternoon, evening), providing a clear picture of the café's performance during different time slots. The system offers revenue charts that help managers assess financial performance visually and understandably. This allows managers to not only track revenue but also forecast trends and adjust business strategies accordingly.

Additionally, the system tracks top-selling food and beverage items, helping managers identify popular products and optimize the menu. This information can be used to improve marketing strategies and inventory management, while also boosting sales performance.

The project uses a database to store and process all the information related to the café's operations, ensuring that the data is synchronized and updated in real-time. The system is developed with the principle of being simple, easy to understand, and convenient, helping optimize tasks for employees while enhancing the management capabilities for café operators.

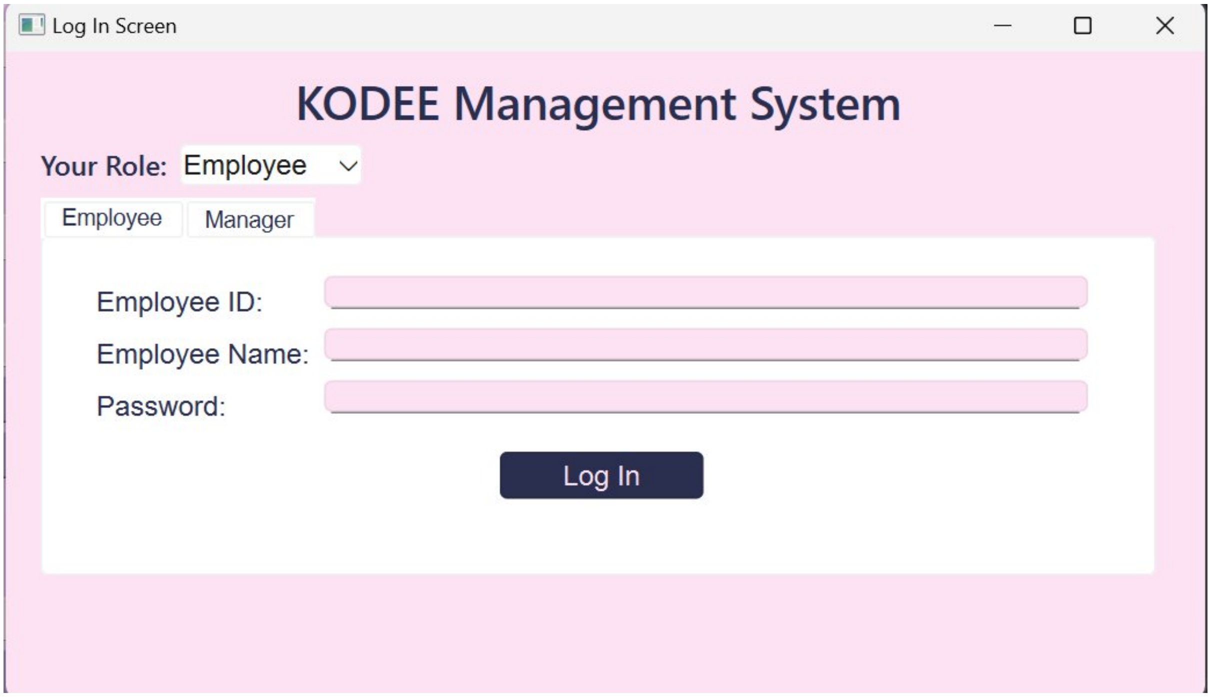
With its powerful features and flexible scalability, this internet café management software is expected to bring significant benefits in optimizing operational processes, improving employee productivity, and driving revenue growth for the café.

4.2. Software Interface Mockup

The software is divided into two main interfaces:

4.2.1. Employee Interface

Login:



KODEE Management System

Your Role: Employee

Figure 4. 1. Employee Login Screen

Login Steps:

1. *Enter Employee Name:*

The user must enter the employee's name in the **Employee Name** field. If this field is left empty, the system will display an error message: “Please fill in the complete information.” This ensures that the employee's name is not missed, preventing the system from lacking important information during validation.

2. Enter Employee ID:

The Employee ID must follow a specific format: “NV” + a number from 01 to 05 (for example, NV01, NV02, NV03, …). If the Employee ID is left blank, the system will display an error message: “Please fill in the complete information.” This ensures that the Employee ID information is not overlooked during login. If the Employee ID does not follow the format “NV” + a number from 01 to 05, the system will show an error message: “Incorrect Employee ID format.” This helps users immediately recognize errors when entering an invalid ID, avoiding access to the wrong account.

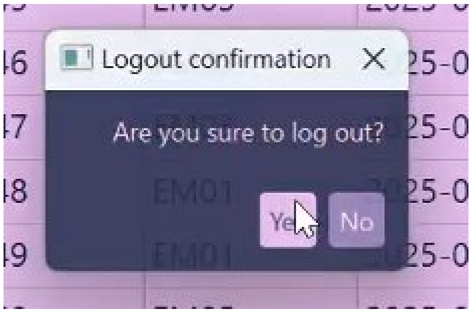
3. Enter Password:

The system's default password is "123". Users must enter the correct password to log in successfully. If the password field is left blank, the system will prompt the user with the message: "Please enter all required information." If the user enters an incorrect password, the system will display an error message: "Incorrect password." This ensures system security and prevents unauthorized access to management functions.

Process after Login successfully:

After the user enters the correct name, employee ID, and password, the system will verify the credentials and redirect them to the main interface of the software corresponding to their role as an Employee. If the login information is valid, the user will be navigated to functional pages such as Food Ordering and Machine Selection.

By clicking Log out button on the top right of the screen, there will be a poped up message to confirm the employee if they want to return to the Login Screen:

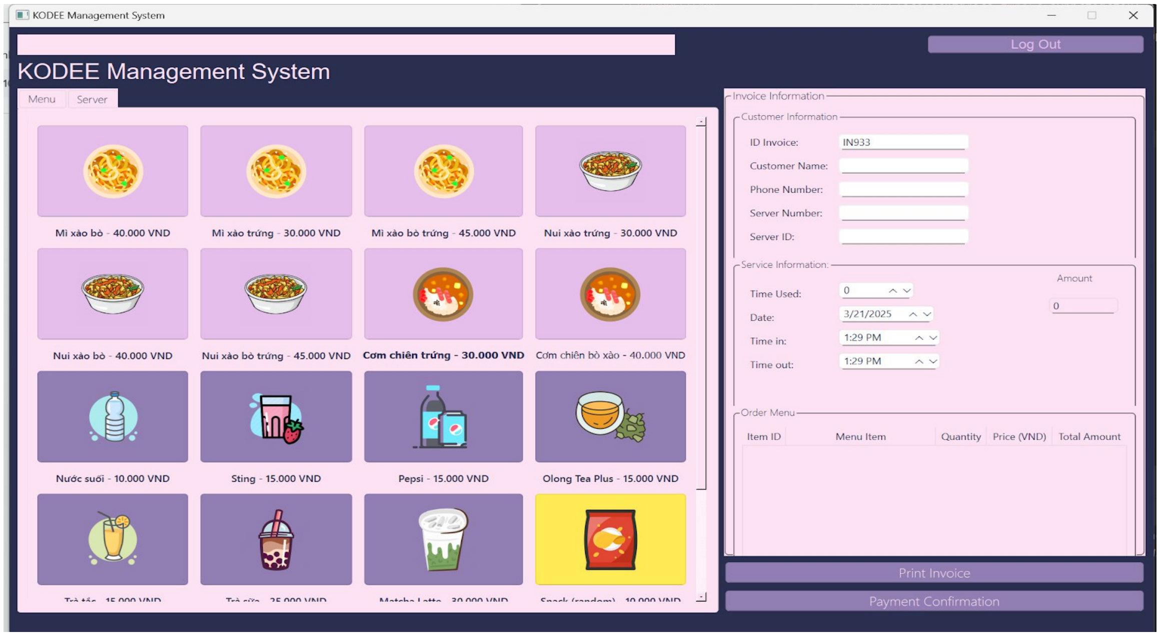


Logout confirmation

Are you sure to log out?

Figure 4. 2. Logout popped up confirmation screen

Tab Menu:



KODEE Management System

Invoice Information

Customer Information

ID Invoice: IN933

Customer Name:

Phone Number:

Server Number:

Server ID:

Service Information:

Time Used: 0

Date: 3/21/2025

Time in: 1:29 PM

Time out: 1:29 PM

Amount 0

Order Menu

Item ID	Menu Item	Quantity	Price (VND)	Total Amount

KODEE Management System
Log Out
Menu
Server
Mì xào bò - 40.000 VND
Mì xào trứng - 30.000 VND
Mì xào bò trứng - 45.000 VND
Nui xào trứng - 30.000 VND
Nui xào bò - 40.000 VND
Nui xào bò trứng - 45.000 VND
Cơm chiên trứng - 30.000 VND
Cơm chiên bò xào - 40.000 VND
Nước suối - 10.000 VND
Sting - 15.000 VND
Pepsi - 15.000 VND
Olong Tea Plus - 15.000 VND
Trà tắc - 15.000 VND
Trà sữa - 25.000 VND
Matcha Latte - 30.000 VND
Snack (random) - 10.000 VND
Print Invoice
Payment Confirmation

Figure 4. 3. Tab Menu in Employee Page

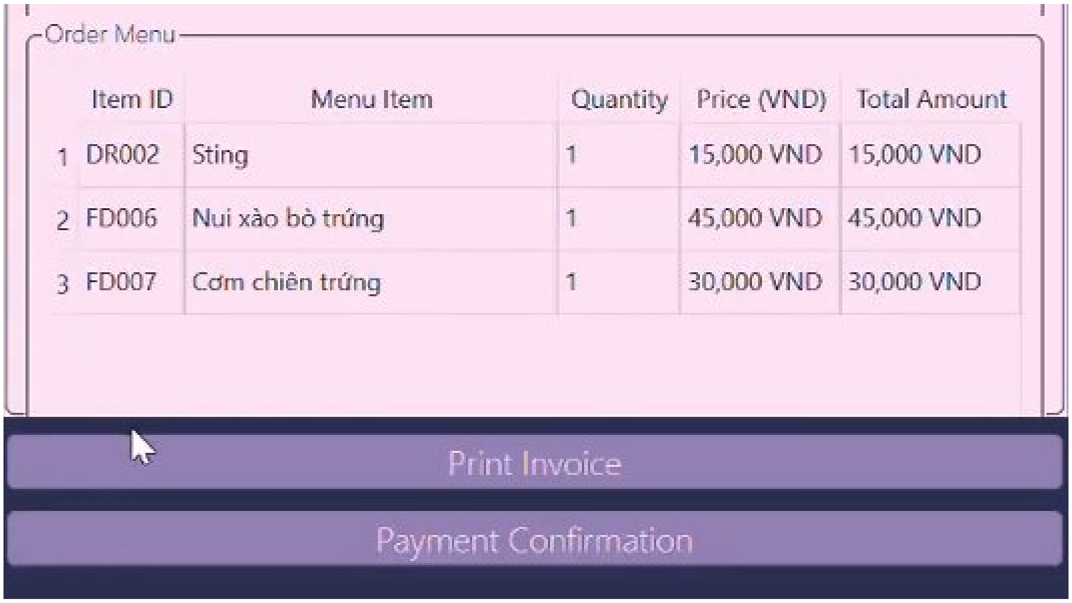
The Menu Selection section allows employees to easily choose food or beverages for customers from the available menu. After selecting items, the information will be updated in the Order Menu list for the payment process. The interface is divided into the following sections:

1. *GroupBox Menu:*

Each food or beverage item will be displayed with details such as Name, Unit Price, and Adjustable Quantity. Employees can select items from these categories as needed.

2. Choose Food/Beverage:

Employees can select food or beverages from the available menu by clicking on the desired item. Once selected, the item name will be added to the Order Menu section within the GroupBox Invoice Information on the right.


Order Menu

	Item ID	Menu Item	Quantity	Price (VND)	Total Amount
1	DR002	Sting	1	15,000 VND	15,000 VND
2	FD006	Nui xào bò trứng	1	45,000 VND	45,000 VND
3	FD007	Cơm chiên trứng	1	30,000 VND	30,000 VND

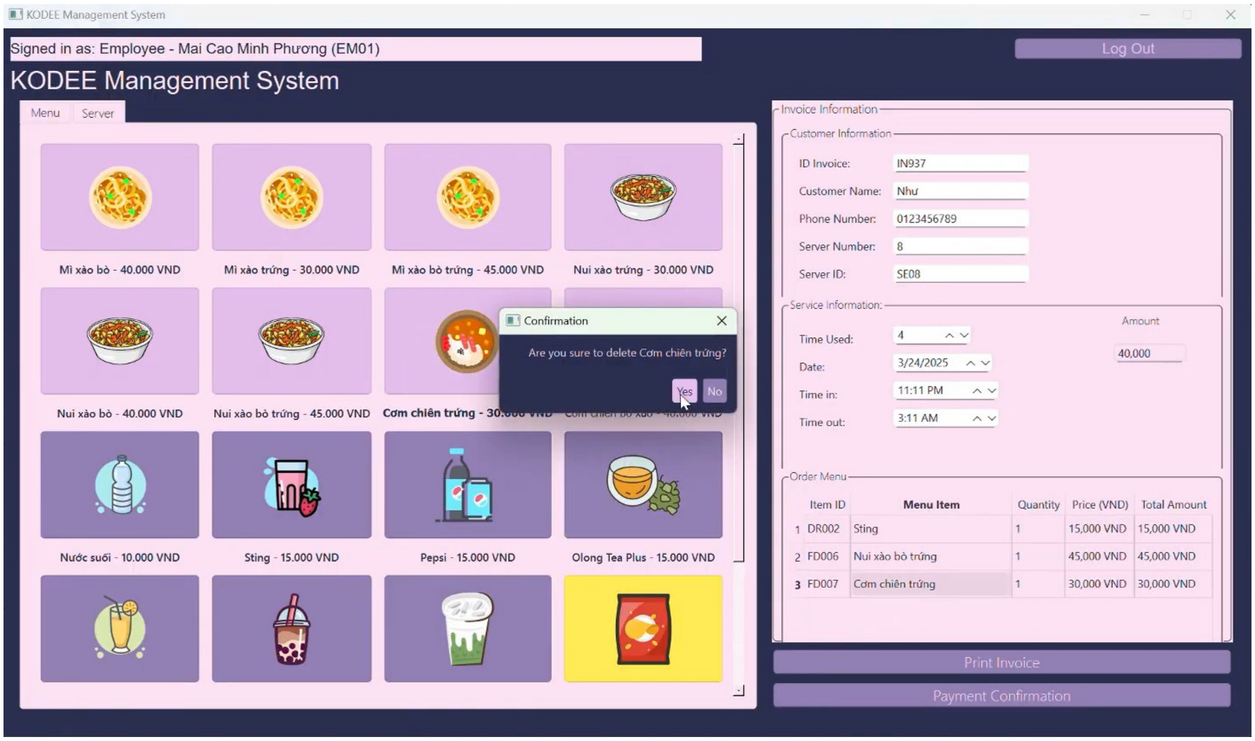
Figure 4. 4. Add menu items into Order Menu Groupbox

Employees can adjust the quantity based on customer requests by clicking on the same item again (if an item is selected multiple times, its quantity will automatically increase). The total price for each item will be calculated automatically based on the unit price and quantity.

3. Delete order:

To remove a selected item, employees simply double-click on the item row in the display table. After double-clicking, the system will show a delete confirmation message, asking the employee to confirm the action.

Once confirmed, the food or beverage item will be removed from the Order Menu list, and the total amount in Invoice Information will be updated accordingly.



Signed in as: Employee - Mai Cao Minh Phương (EM01)

KODEE Management System

Are you sure to delete Cơm chiên trứng?

ID Invoice: IN937

Customer Name: Như

Phone Number: 0123456789

Server Number: 8

Server ID: SE08

Time Used: 4

Date: 3/24/2025

Time in: 11:11 PM

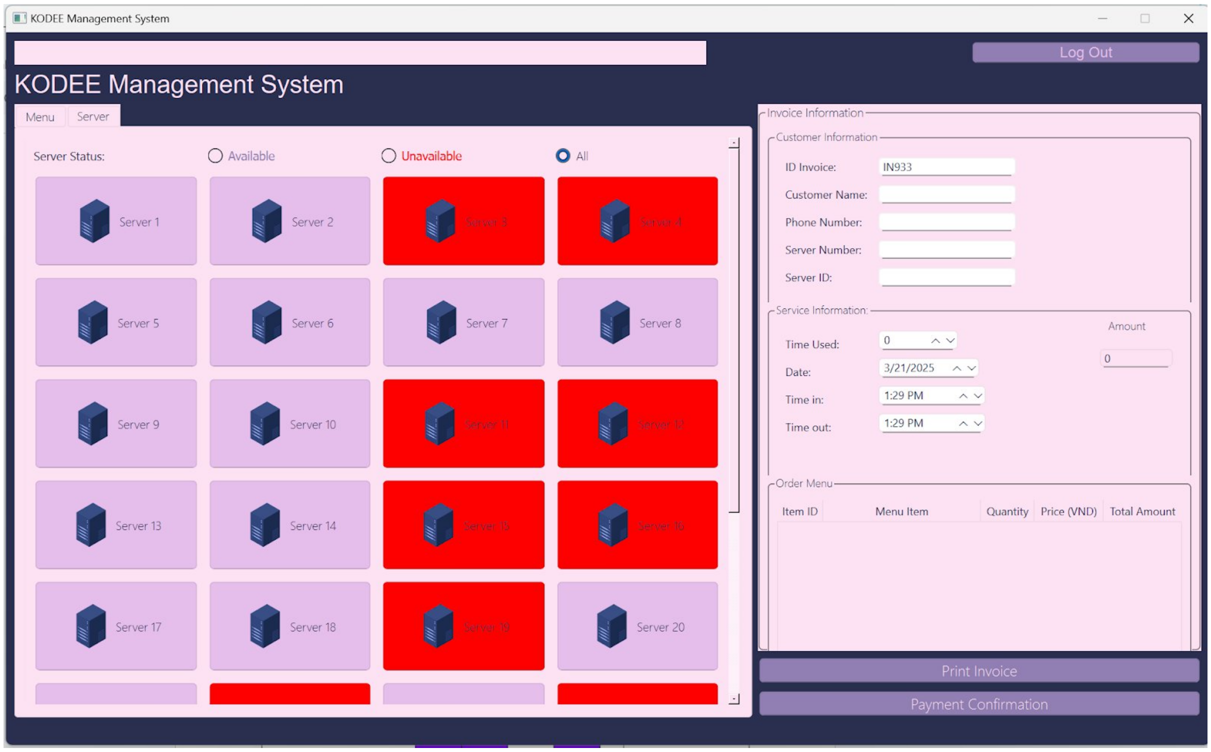
Time out: 3:11 AM

Amount: 40,000

	Item ID	Menu Item	Quantity	Price (VND)	Total Amount
1	DR002	Sting	1	15,000 VND	15,000 VND
2	FD006	Nui xào bò trứng	1	45,000 VND	45,000 VND
3	FD007	Cơm chiên trứng	1	30,000 VND	30,000 VND

Figure 4. 5. Example of deleting an menu item in groupbox Order Menu

Tab Server:



Server Status: ○ Available ○ Unavailable ● All

ID Invoice: IN933

Customer Name:

Phone Number:

Server Number:

Server ID:

Time Used: 0

Date: 3/21/2025

Time in: 1:29 PM

Time out: 1:29 PM

Amount: 0

Figure 4. 6. Tab Server in Employee Page

The Computer Selection section allows employees to assign an available computer to a customer while managing the status of each computer in the store. This feature helps employees easily identify which computers are in use and which are available.

1. *The computer location diagram:*

The interface will display a computer position diagram representing 30 computer slots, each visually indicating the machine's status using different colors:

Purple: Available – Ready for customer use.

Red: Occupied – Cannot be selected.

White: Selected – Currently being assigned by an employee.

2. *Computer code:*

Each computer is assigned a machine code in the format "M" followed by a number from M01 to M30 (e.g., M01, M02, M03, etc.).

When an employee clicks on a machine slot (e.g., M01), its machine code will automatically appear in the QLineEdit Server Number and Server ID fields within the GroupBox Customer Information on the right, ensuring clear tracking of the assigned machine.

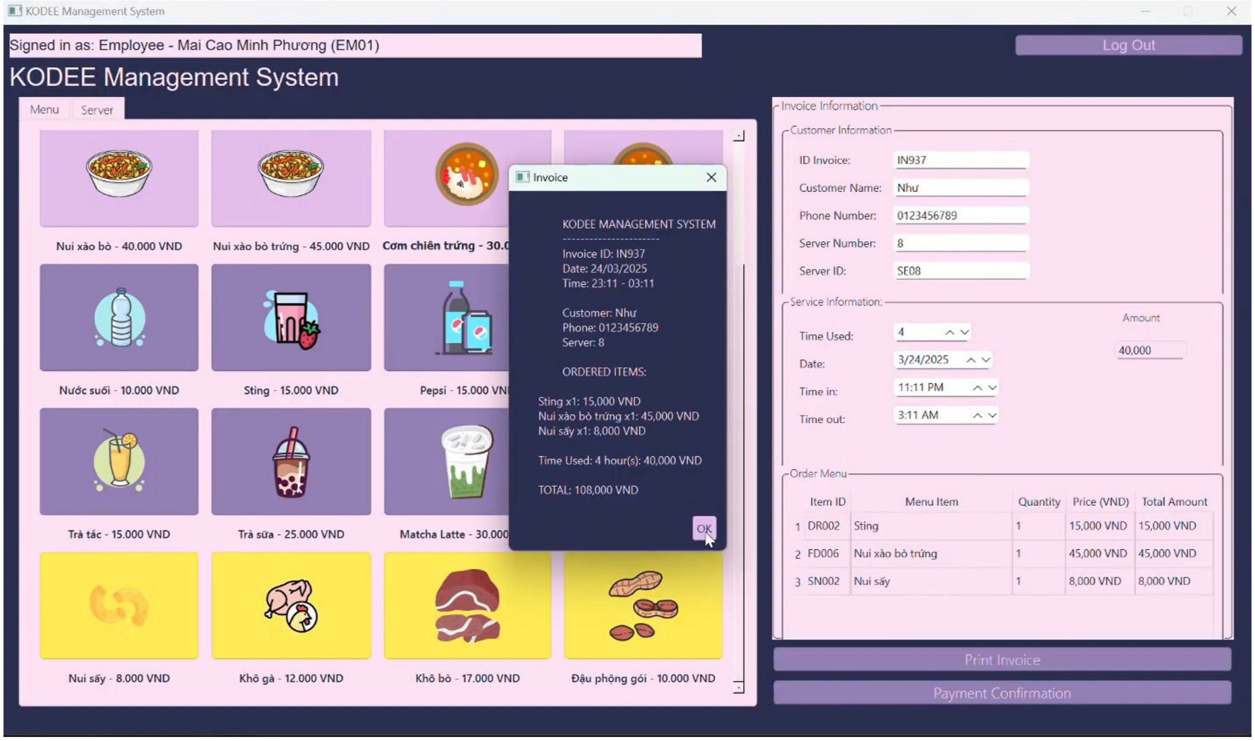
To deselect a machine, the employee simply clicks on it again, changing its status back to purple (available), allowing it to be selected again by another employee or customer

3. *Selecting Computer Usage Time:*

Employees will select the computer usage duration from the available ComboBox options, such as 1 hour, 5 hours, 10 hours, 24 hours, etc. Each selected time option will have a corresponding price, and when the employee changes the time selection, the unit price will be automatically updated based on the selected duration, multiplied by 10,000 VND.

The Time and Price values will be automatically displayed in a ComboBox, allowing employees to accurately read the billing information for customers to review. These values include the Time In (start time) and Time Out (end time).

After all, by clicking “Print Invoice”, the detailed invoice information will be poped up on screen or clicking “Paymen Confirmation” to finally confirm with custmers:



Signed in as: Employee - Mai Cao Minh Phương (EM01)

KODEE Management System

Invoice

```
KODEE MANAGEMENT SYSTEM
----------------------
Invoice ID: IN937
Date: 24/03/2025
Time: 23:11 - 03:11

Customer: Như
Phone: 0123456789
Server: 8

ORDERED ITEMS:

Sting x1: 15,000 VND
Nui xào bò trứng x1: 45,000 VND
Nui sấy x1: 8,000 VND

Time Used: 4 hour(s): 40,000 VND

TOTAL: 108,000 VND
```

Invoice Information

Customer Information

ID Invoice: IN937
Customer Name: Như
Phone Number: 0123456789
Server Number: 8
Server ID: SE08

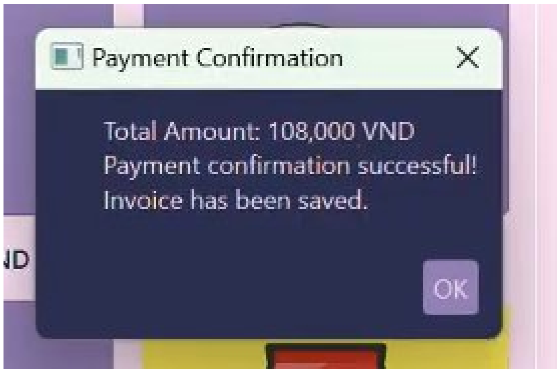
Service Information:

Time Used: 4
Date: 3/24/2025
Time in: 11:11 PM
Time out: 3:11 AM
Amount: 40,000

Order Menu

	Item ID	Menu Item	Quantity	Price (VND)	Total Amount
1	DR002	Sting	1	15,000 VND	15,000 VND
2	FD006	Nui xào bò trứng	1	45,000 VND	45,000 VND
3	SN002	Nui sấy	1	8,000 VND	8,000 VND

Figure 4. 7. Example of clicking "Print Invoice" button



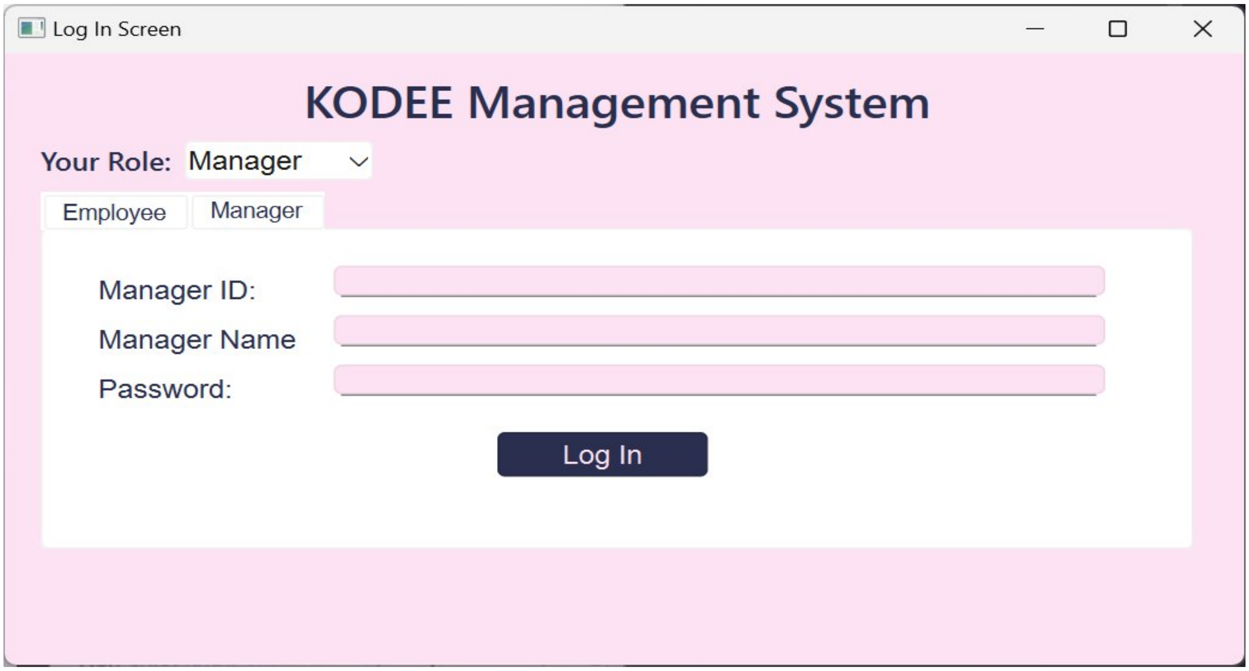
Payment Confirmation

Total Amount: 108,000 VND
Payment confirmation successful!
Invoice has been saved.

Figure 4. 8. Example of clicking "Payment Confirmation" button

4.2.2. Management Interface

Login



Your Role: Manager

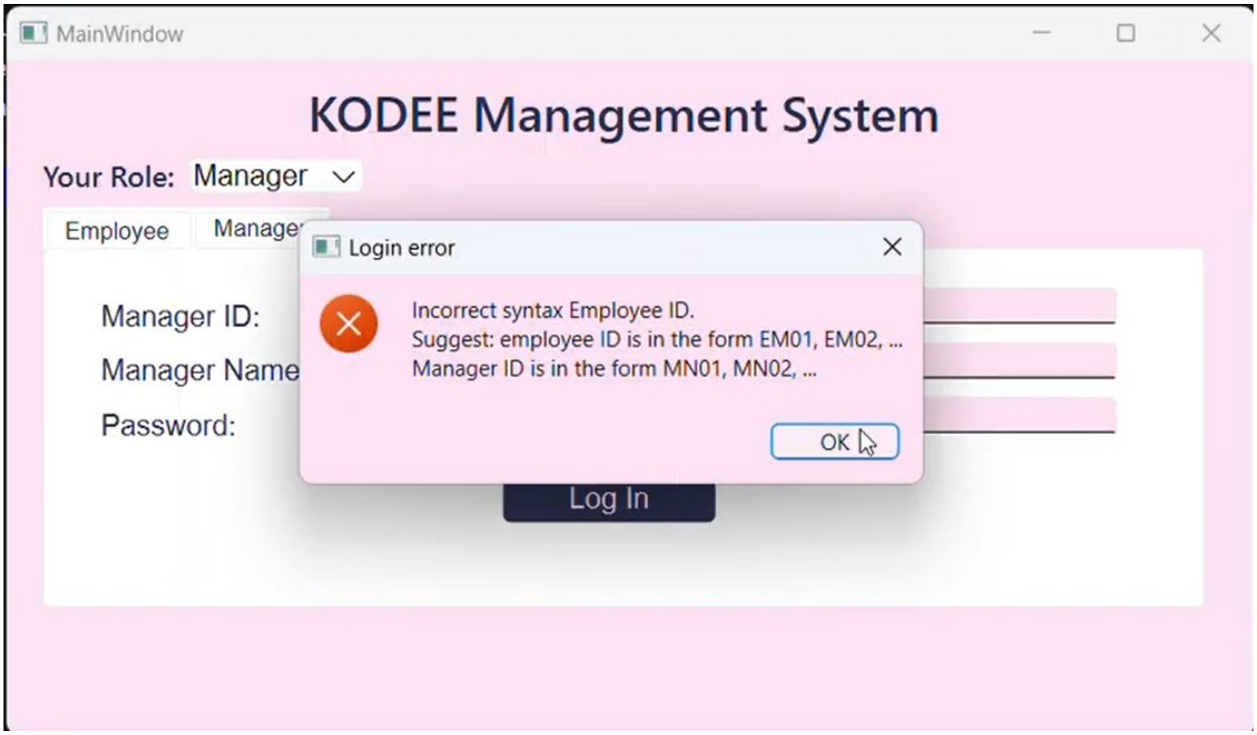
Figure 4. 9. Management Login Screen

The Manager Login Interface requires the manager to enter authentication details, including Manager ID, Manager Name, and Password. The system includes an error validation mechanism to ensure the information is entered correctly and completely. Below is a detailed description:

1. *Manager Code*

The Manager Code is required to follow a specific format, which consists of the prefix "NV" followed by two digits ranging from 01 to 05 (for example, NV01, NV02, NV03, NV04, NV05).

If the user leaves the field blank or enters an incorrect format, the system will display an error message to notify them of the issue. The possible error messages include: "Please enter a valid Manager Code." – This appears when the field is left empty; and "Invalid Manager Code format." – This appears when the entered code does not follow the correct format.



Incorrect syntax Employee ID.
Suggest: employee ID is in the form EM01, EM02, ...
Manager ID is in the form MN01, MN02, ...

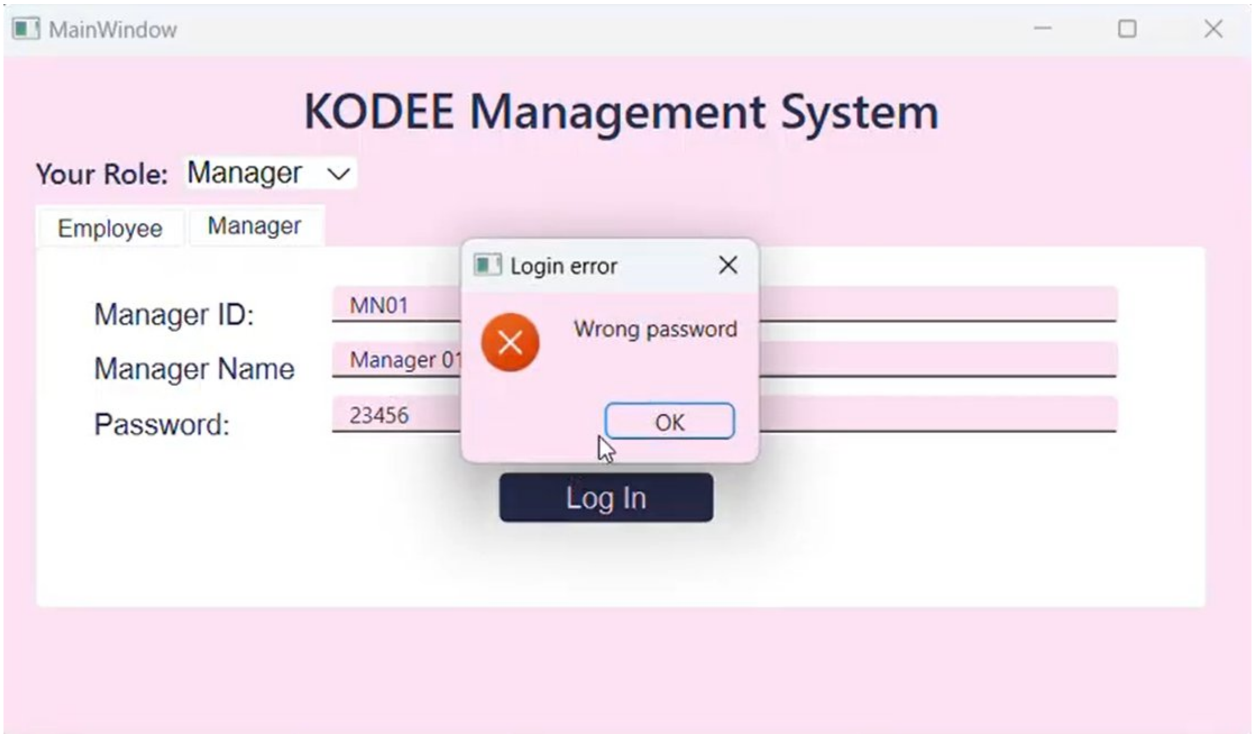
Figure 4. 10. Example of Login Error 1

2. *Manager's Name*

The user is required to enter the Manager Name in the designated field. If this field is left blank, the system will display an error message: "Please enter the Manager Name."

3. *Password:*

The default Manager Password is set to "123". If the password is incorrect or left blank, the system will display an error message: "Wrong password." – If the entered password is wrong; and "Please enter the password." If the field is empty. Once the required information is entered correctly and successfully verified, the manager will be redirected to the Dashboard Interface, where they can manage and monitor the activities of the internet café.


MainWindow

KODEE Management System

Your Role: Manager

Manager ID: MN01

Manager Name: Manager 01

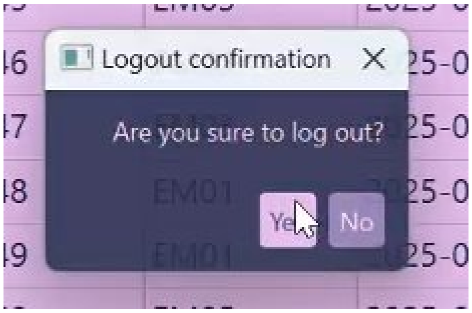
Password: 23456

Login error

Wrong password

Figure 4. 11. Example of Login Error 2

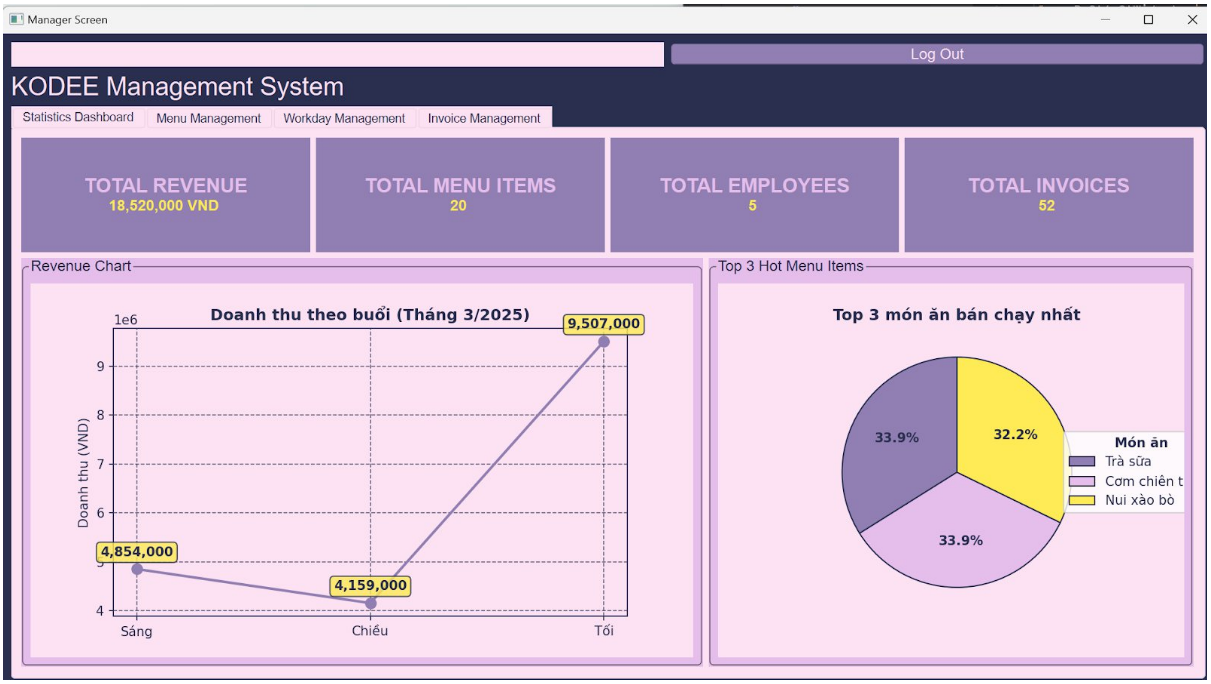
By clicking Log out button on the top right of the screen, there will be a poped up message to confirm the manager if they want to return to the Login Screen:


Logout confirmation

Are you sure to log out?

Figure 4. 12. Logout Confirmation popped up screen

Dashboard Interface:



Manager Screen

KODEE Management System

TOTAL REVENUE 18,520,000 VND

TOTAL MENU ITEMS 20

TOTAL EMPLOYEES 5

TOTAL INVOICES 52

Figure 4. 13. Tab Statistic Dashboard in Management Page

The Dashboard Interface of the KODEE Net Cafe Service Management Software is designed to help managers effectively monitor the operations of the internet café through key overview metrics such as revenue, number of employees, number of food and beverage items in the menu, and total invoices. This screen provides real-time information, allowing managers to gain a comprehensive view of the business performance and overall status of the café.

1. *Small Groupboxes*

The Revenue GroupBox displays the current total revenue of the café. This data is collected from all paid invoices within the system. It is directly linked to the Invoice Management page, allowing managers to track revenue in real-time. Within the Revenue GroupBox, there will be a QLabel displaying the field name "Revenue" and a QLineEdit showing the current revenue value, such as 18,520,000 VND.

The Employee Count GroupBox displays the total number of employees currently working at the café. This data is retrieved from the Shift Management page. Similar to the

Revenue GroupBox, it includes a QLabel displaying the field name and a QLineEdit showing the current number of employees, for example, 5 employees.

The Menu Item Count GroupBox displays the total number of food and beverage items available on the café's menu. This data is sourced from the Menu Management page. Inside this GroupBox, a QLabel displays the field name, and a QLineEdit shows the current number of menu items, such as 20 items.

The Total Invoices GroupBox displays the total number of paid invoices in the system. This data is also retrieved from the Invoice Management page. The GroupBox includes a QLabel displaying the field name and a QLineEdit showing the current number of invoices, for instance, 52 invoices.

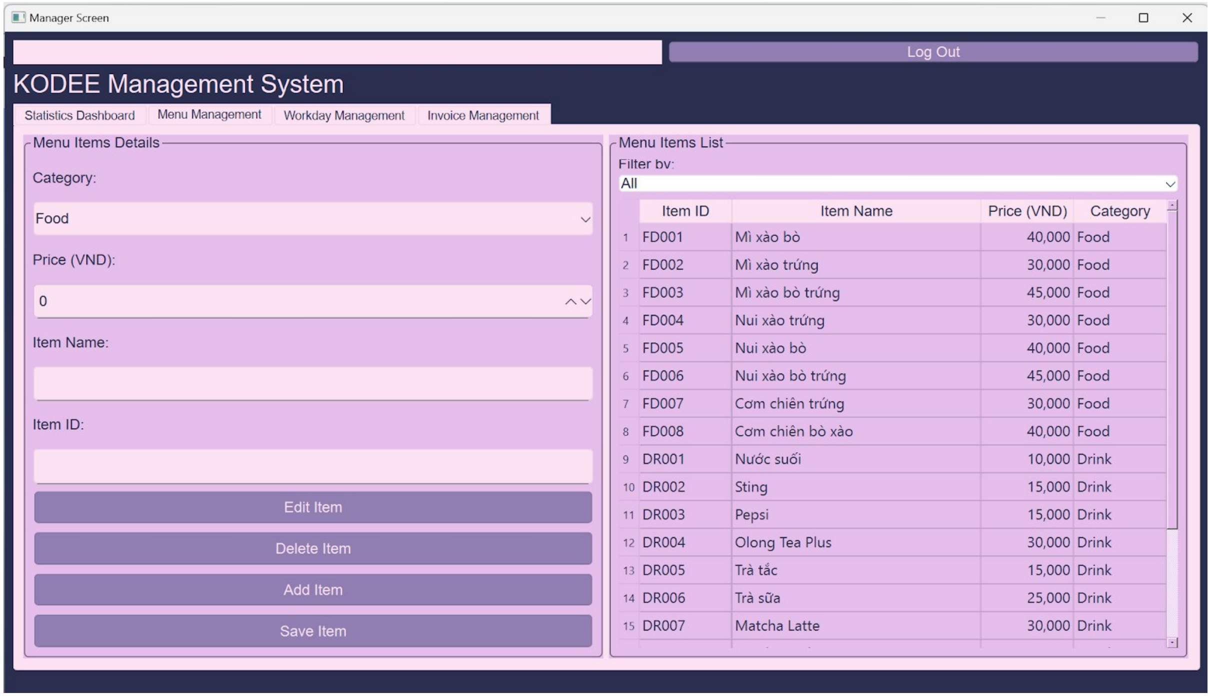
2. Statistics Chart

The Daily Revenue Statistics Chart is a line chart that represents revenue across different time periods of the day: Morning, Afternoon, and Evening. The X-axis represents the time of day (Morning, Afternoon, Evening), while the Y-axis represents the revenue in VND. This chart uses the total revenue data from all invoices for each time period, sourced from the Invoice Management page. By analyzing this chart, managers can gain a clear understanding of the business performance throughout the day and make informed decisions accordingly.

The Top 3 Best-Selling Dishes Chart is a pie chart that visualizes the most popular food items in the café. The data for this chart is retrieved from the Invoice Management page, specifically focusing on the dishes with the highest order quantities. The pie chart displays the percentage share of the top three best-selling dishes, labeled as Dish 1, Dish 2, and Dish 3. This allows managers to easily identify the highest-revenue-generating food items, enabling them to promote these dishes further or ensure sufficient ingredient stock.

All data in these GroupBoxes is continuously updated whenever changes occur in the system, such as adding new dishes, modifying the number of employees, or processing invoice payments. This can be achieved through a data refresh mechanism or by implementing automatic synchronization between different parts of the system.

Menu Management Interface



Category: Food

Price (VND): 0

Item Name:

Item ID:

Filter by: All

	Item ID	Item Name	Price (VND)	Category
1	FD001	Mì xào bò	40,000	Food
2	FD002	Mì xào trứng	30,000	Food
3	FD003	Mì xào bò trứng	45,000	Food
4	FD004	Nui xào trứng	30,000	Food
5	FD005	Nui xào bò	40,000	Food
6	FD006	Nui xào bò trứng	45,000	Food
7	FD007	Cơm chiên trứng	30,000	Food
8	FD008	Cơm chiên bò xào	40,000	Food
9	DR001	Nước suối	10,000	Drink
10	DR002	Sting	15,000	Drink
11	DR003	Pepsi	15,000	Drink
12	DR004	Olong Tea Plus	30,000	Drink
13	DR005	Trà tắc	15,000	Drink
14	DR006	Trà sữa	25,000	Drink
15	DR007	Matcha Latte	30,000	Drink

Figure 4. 14. Tab Menu Management in Management Page

The Menu Management Interface in the KODEE Net Cafe Service Management Software is designed to help administrators efficiently oversee the café's food and beverage offerings. This interface provides a centralized platform where managers can easily add new menu items, modify existing ones, and remove dishes or drinks that are no longer available.

In addition to basic menu management, the system allows for updating detailed information for each item, such as name, price, category, and availability. By keeping the menu well-organized and up to date, managers can ensure that both employees and customers have access to the latest offerings, improving service efficiency and overall customer experience. This feature also enables seamless integration with the ordering system, ensuring that changes made in the menu are instantly reflected when employees take customer orders.

1. *The Detailed Item Information GroupBox*

The interface provides a GroupBox titled "Menu Item Details", where managers can enter and edit detailed information about food and beverage items. Additionally, a separate GroupBox named "Menu Items List" is displayed in a QTableWidget format, allowing managers to review and check existing menu items efficiently.

Each food or beverage item is assigned a unique identifier, such as FD001 for Stir-Fried Beef Noodles. The name of the dish or drink is displayed clearly, ensuring easy identification. The unit price field allows managers to manually input the cost of each item, for example, 40,000 VND. To streamline organization, each menu item is categorized into specific groups, such as Food or Beverage, which can be selected using a ComboBox.

This structured approach ensures that all menu items are properly categorized, easily accessible, and accurately priced, improving overall management efficiency.

2. *Functional Buttons:*

When an employee or manager edits the details of a food item, they can press the Save button to update the changes in the database. After clicking Save, the information in the QTableWidget will be refreshed to reflect the latest updates.

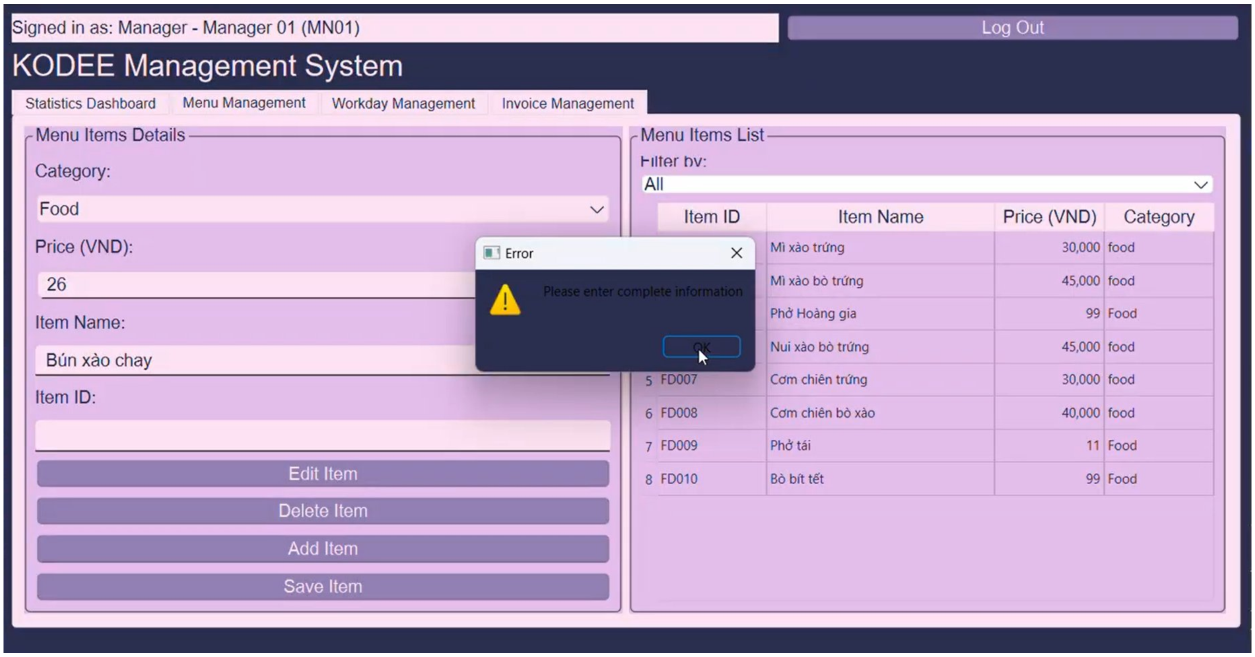
To add a new item to the menu, employees or managers can use the Add Item button. After entering all the necessary details, including Item Code, Item Name, Unit Price, and Category, the new item will be added to the list.

For deleting an item, employees can select the item from the list and press the Delete Item button. A confirmation message will appear, asking them to confirm the deletion before proceeding.

When modifying an existing item, clicking on a row in the QTableWidget will automatically display the item's details in the corresponding input fields for Item Code, Item Name, Unit Price, and Category. Once the necessary edits are made, pressing Save will update the information in the system.

3. *Feedback Notifications After Each Action*

After performing actions such as updating or deleting a menu item, the system will display feedback notifications to ensure clarity and confirmation. When saving changes, a "Update Successful" message will appear, confirming that the modifications have been successfully stored in the system. When deleting an item, the system will prompt a confirmation message: "Are you sure you want to delete this item?" This ensures that managers or employees must explicitly confirm before the deletion is finalized.



Signed in as: Manager - Manager 01 (MN01)

KODEE Management System

Menu Items Details

Category: Food

Price (VND): 26

Item Name: Bún xào chay

Item ID:

Error

Please enter complete information

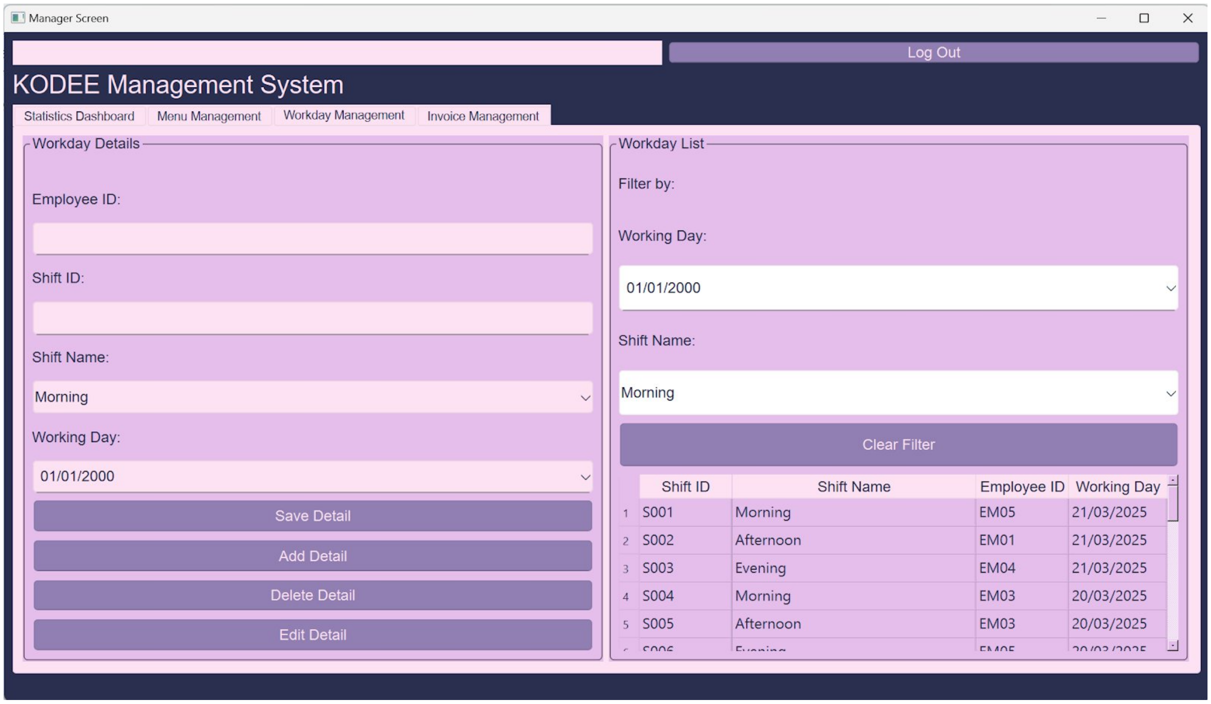
Menu Items List

Filter by: All

	Item ID	Item Name	Price (VND)	Category
		Mì xào trứng	30,000	food
		Mì xào bò trứng	45,000	food
		Phở Hoàng gia	99	Food
		Nui xào bò trứng	45,000	food
5	FD007	Cơm chiên trứng	30,000	food
6	FD008	Cơm chiên bò xào	40,000	food
7	FD009	Phở tái	11	Food
8	FD010	Bò bít tết	99	Food

Figure 4. 15. Example of error in Tab Menu Management

Workday Management



Employee ID:

Shift ID:

Shift Name: Morning

Working Day: 01/01/2000

Filter by:

Working Day: 01/01/2000

Shift Name: Morning

	Shift ID	Shift Name	Employee ID	Working Day
1	S001	Morning	EM05	21/03/2025
2	S002	Afternoon	EM01	21/03/2025
3	S003	Evening	EM04	21/03/2025
4	S004	Morning	EM03	20/03/2025
5	S005	Afternoon	EM03	20/03/2025
6	S006	Evening	EM05	20/03/2025

Figure 4. 16. Tab Workday Management in Management Page

The Work Shift Management Screen in the KODEE Net Cafe Service Management software allows managers to efficiently monitor and adjust employee work schedules. This interface provides detailed information about each shift, including Shift Code, Shift Name, Employee ID, Employee Name, and Work Date.

Additionally, the system offers filtering and search functions, enabling managers to quickly locate specific shifts based on various criteria. This streamlined approach ensures smooth scheduling operations and better workforce management.

1. *GroupBox Workday List - Thông Tin Chi Tiết Ca Làm:*

The Filtering and Search functionality allows managers to efficiently locate work shifts based on different criteria. Managers can filter by date using a ComboBox to select a specific day, making it easy to find shifts scheduled for a particular date. They can also filter by shift name through a ComboBox, selecting options such as Morning, Afternoon, or Evening to display shifts corresponding to a specific time period.

A "Clear Filter" button is available for resetting all applied filters, restoring the full shift data view. The interface includes a GroupBox containing a QTableWidget that displays detailed work shift information. The columns in this table include Shift Code, which uniquely identifies each shift (e.g., S001, S002); Shift Name, indicating the shift's time period (e.g., Morning, Afternoon, Evening); Employee ID, the unique identifier for employees working that shift (e.g., EM05); Employee Name, displaying the full name of the employee assigned to the shift; and Work Date, showing the exact date of the shift in a day/month/year format (e.g., 21/03/2025).

2. GroupBox Workday Details - CRUD of employees' shifts

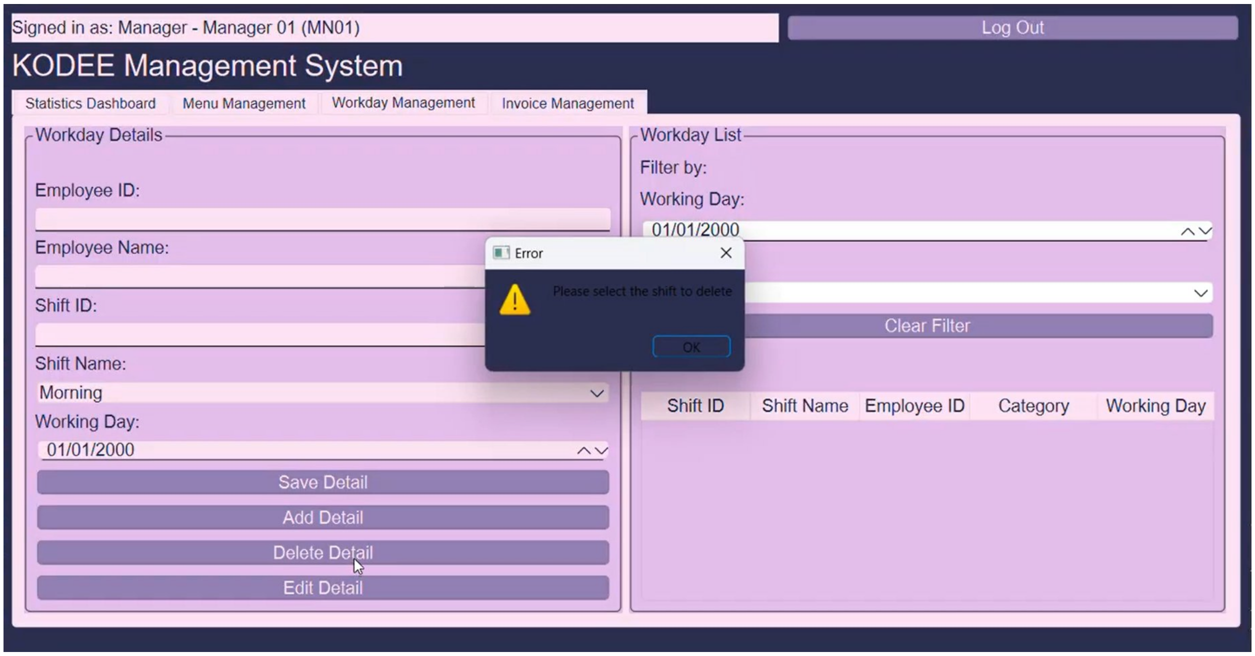
The manager enters the Employee ID in the QLineEdit Employee ID field and the Shift ID in the QLineEdit Shift ID field. Then, they select the shift timing from the ComboBox Shift Name and specify the Working Day. Once all details are set, the manager can use the following QPushButton functions

Save Detail - After modifying shift details, the manager can press Save Detail to update the information in the system.

Add Detail - To assign a new shift to an employee, the manager fills in the required fields and clicks Add Detail to save the entry.

Delete Detail - If the manager wants to remove a shift from the schedule, they can select it from the table and press Delete Detail. The system will prompt a confirmation message before deleting the record.

Edit Detail - If shift details need to be modified, the manager selects the shift, clicks Edit Detail, and updates the necessary fields. The changes can then be saved for future reference.



Signed in as: Manager - Manager 01 (MN01)

KODEE Management System

Employee ID:

Employee Name:

Shift ID:

Shift Name: Morning

Working Day: 01/01/2000

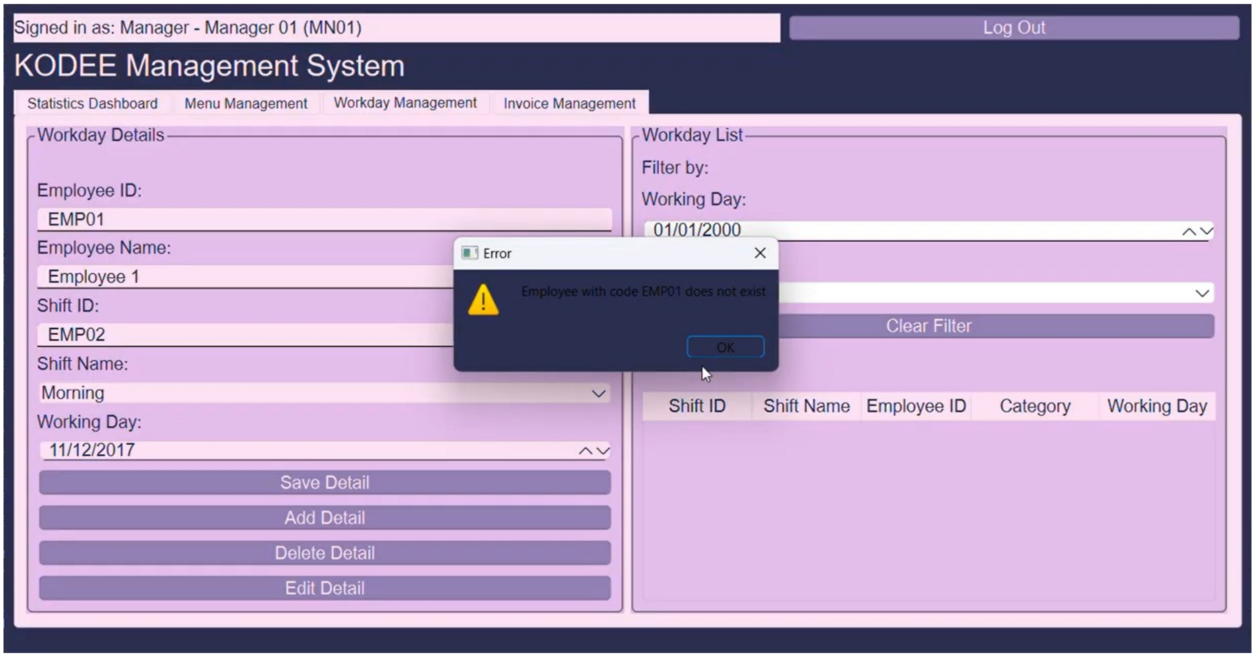
Filter by:

Working Day: 01/01/2000

Error

Please select the shift to delete

Figure 4. 17. Example of error in Tab Workday Management



Signed in as: Manager - Manager 01 (MN01)

KODEE Management System

Employee ID: EMP01

Employee Name: Employee 1

Shift ID: EMP02

Shift Name: Morning

Working Day: 11/12/2017

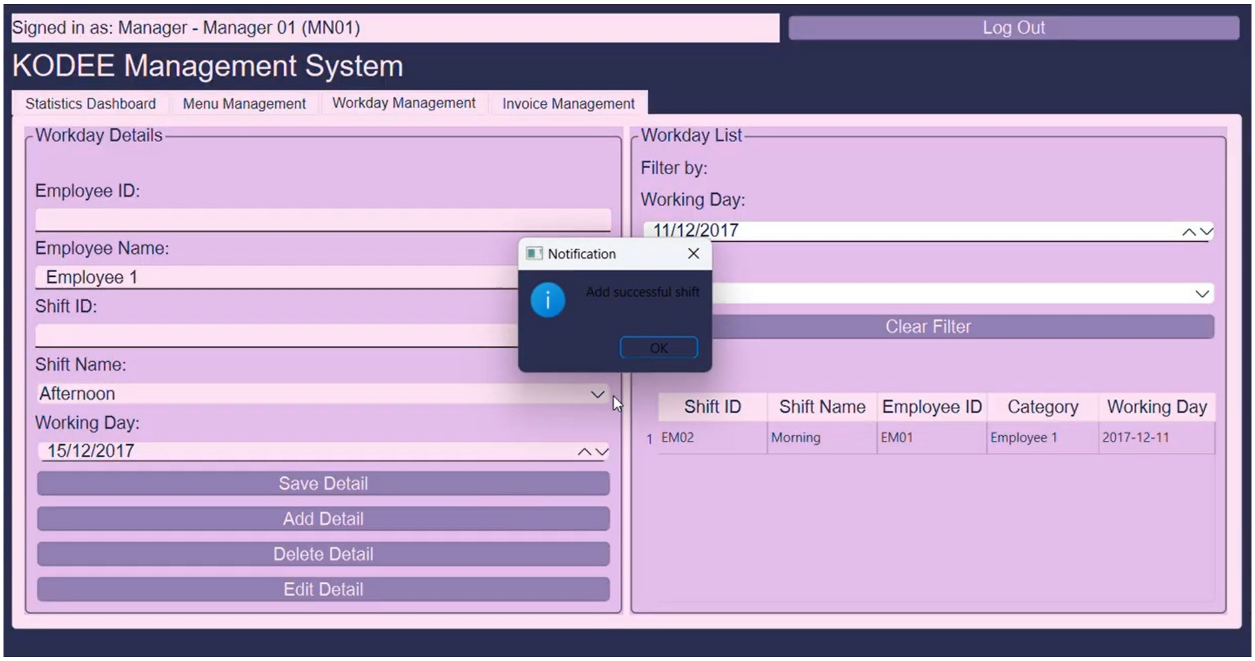
Filter by:

Working Day: 01/01/2000

Error

Employee with code EMP01 does not exist

Figure 4. 18. Example of error in Tab Workday Management



Signed in as: Manager - Manager 01 (MN01)

KODEE Management System

Workday Details

Employee ID:

Employee Name: Employee 1

Shift ID:

Shift Name: Afternoon

Working Day: 15/12/2017

Notification

Add successful shift

Workday List

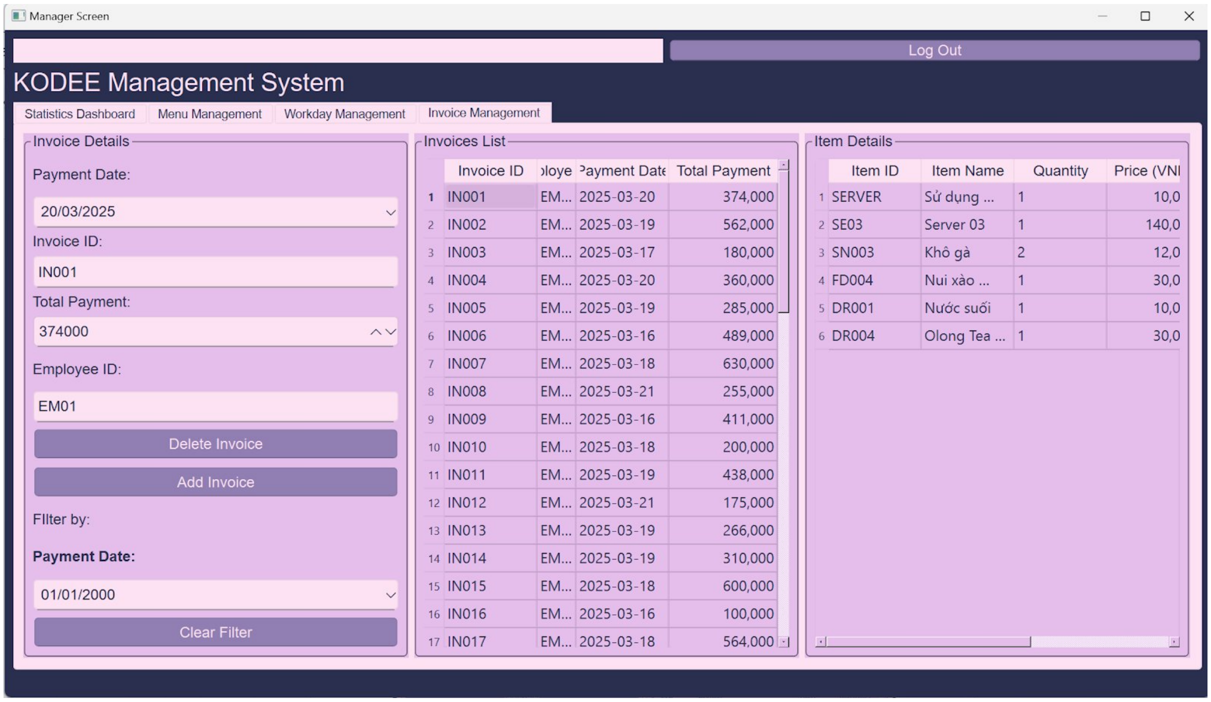
Filter by:

Working Day: 11/12/2017

	Shift ID	Shift Name	Employee ID	Category	Working Day
1	EM02	Morning	EM01	Employee 1	2017-12-11

Figure 4. 19. Popped up message in Tab Workday Management

Invoice Management Interface



Manager Screen

KODEE Management System

Invoice Details

Payment Date: 20/03/2025

Invoice ID: IN001

Total Payment: 374000

Employee ID: EM01

FIlter by:

Payment Date: 01/01/2000

Invoices List

	Invoice ID	ıloye	ᕈayment Date	Total Payment
1	IN001	EM...	2025-03-20	374,000
2	IN002	EM...	2025-03-19	562,000
3	IN003	EM...	2025-03-17	180,000
4	IN004	EM...	2025-03-20	360,000
5	IN005	EM...	2025-03-19	285,000
6	IN006	EM...	2025-03-16	489,000
7	IN007	EM...	2025-03-18	630,000
8	IN008	EM...	2025-03-21	255,000
9	IN009	EM...	2025-03-16	411,000
10	IN010	EM...	2025-03-18	200,000
11	IN011	EM...	2025-03-19	438,000
12	IN012	EM...	2025-03-21	175,000
13	IN013	EM...	2025-03-19	266,000
14	IN014	EM...	2025-03-19	310,000
15	IN015	EM...	2025-03-18	600,000
16	IN016	EM...	2025-03-16	100,000
17	IN017	EM...	2025-03-18	564,000

Item Details

	Item ID	Item Name	Quantity	Price (VNI
1	SERVER	Sử dụng ...	1	10,0
2	SE03	Server 03	1	140,0
3	SN003	Khô gà	2	12,0
4	FD004	Nui xào ...	1	30,0
5	DR001	Nước suối	1	10,0
6	DR004	Olong Tea ...	1	30,0

Figure 4. 20. Tab Invoice Management in Management Page

The Invoice Management Screen in KODEE Net Cafe Service Management provides managers with the ability to track, manage, and review detailed information about invoices that have been processed at the café. This interface allows managers to efficiently search for invoices, filter them based on various criteria, and view detailed records of each transaction.

1. *GroupBox Invoice Details:*

The interface provides a GroupBox to display detailed invoice information, including:

The Invoice ID, which uniquely identifies each invoice (e.g., IN001, IN002).

The Employee ID, which is the unique identifier of the staff member who processed the payment (e.g., EM01, EM02).

The Cashier Name, displaying the name of the employee who handled the transaction.

The Payment Date, showing the date and session (Morning, Afternoon, Evening) when the payment was completed.

The Total Amount, displaying the total value of the invoice within a QLineEdit.

At the bottom, there is also a Payment Date filter for searching and filtering invoices: Managers can use a ComboBox to filter invoices by the month of payment, making it easier to search for invoices within a specific time frame. A "Clear Filter" button allows managers to reset the filters and display the full list of invoices after performing a search.

2. *GroupBox Invoices List*

At this point, a QTableWidget is used to display the list of paid invoices, with columns including:

The Invoice ID, which uniquely identifies each invoice.

The Employee ID, representing the staff member who processed the payment.

The Cashier Name, displaying the name of the employee who handled the transaction.

The Payment Date, showing the date and session (Morning, Afternoon, Evening) of the payment.

The Total Amount, displaying the total value of each invoice.

Managers can easily view and search for invoices within this list. When selecting an invoice, the system will display its detailed information for review.

3. GroupBox Item Details

Invoice details will be displayed when the manager clicks on any invoice ID within the QTableWidget in the Invoices List GroupBox. These details include:

The Item/Computer ID, which uniquely identifies each food item or computer used in the invoice.

The Item/Computer Name, displaying the name of the food item or computer in the invoice.

The Quantity, showing the number of food items or computers used.

The Unit Price, indicating the cost of each food item or computer.

The Total Amount, calculated as quantity × unit price for each item or computer.

Each entry in the invoice details allows the manager to see which items were ordered, the quantity used, and the cost of each item, providing a clear breakdown of the transaction.

Chapter 5: Conclusion And Future Work

5.1. Conclusion

The rapid expansion of internet cafes and gaming centers has created an urgent demand for efficient and automated management systems. The KODEE Net Cafe Service Management software was developed to address this need, offering a streamlined approach to customer service, payment processing, shift management, and revenue tracking. This paper presents the conclusions drawn from the implementation of the software and proposes potential future enhancements to improve its functionality and usability.

The KODEE Net Cafe Service Management software has successfully met the core objectives outlined at the beginning of the project. The system provides a comprehensive solution for internet cafe management by integrating multiple functionalities into a single application.

5.1.1. Key Achievements:

The software features a User-Friendly Interface, utilizing PyQt to create an intuitive graphical user interface (GUI) that allows employees and managers to navigate the system effortlessly.

It Optimizes Workflow for Employees, enabling staff to efficiently manage customer orders, allocate computer stations, and process payments with high accuracy.

A Comprehensive Management Dashboard provides real-time monitoring of revenue, employee shifts, and order management, supporting data-driven decision-making.

The Automated Billing System calculates charges based on usage time and selected services, minimizing human errors in financial transactions.

With Data Synchronization and Real-Time Updates, all management functions remain interconnected, ensuring accurate and immediate data across the system.

5.1.2. Challenges and Limitations

Despite its achievements, the current version of KODEE Net Cafe Service Management has some limitations that need to be addressed in future updates:

Limited Platform Support - The software currently operates only on desktop computers and lacks web or mobile support, making remote management difficult.

Basic Data Analytics - The system only provides basic statistics on revenue and orders, lacking advanced analytical tools for predicting customer trends.

Lack of Online Payment Integration - The system does not yet support digital payment gateways, restricting transaction options for customers.

5.2. Future Development

To enhance the efficiency and scalability of KODEE Net Cafe Service Management, several improvements and new features will be considered in future updates.

5.2.1. Development of Web and Mobile Versions

One of the most critical improvements is transitioning the software to a web-based and mobile-compatible platform. A cloud-based infrastructure will enable managers to monitor operations remotely, providing real-time insights into customer activity, revenue trends, and employee shifts. Additionally, a mobile application will improve the customer experience by allowing users to pre-book computer stations, order food and beverages, and view transaction history.

5.2.2 Integration of Artificial Intelligence (AI) and Machine Learning (ML)

The incorporation of AI and ML algorithms can significantly improve decision-making processes and operational efficiency. Potential AI-driven features include:

Customer Behavior Prediction - AI models can analyze historical data to suggest services and promotions tailored to individual customer preferences.

Dynamic Pricing Strategies **-** Machine learning can help implement flexible pricing models based on peak and off-peak hours, optimizing revenue generation.

Automated Employee Scheduling - AI-powered scheduling systems can optimize shift assignments, ensuring balanced workloads and minimizing human errors.

5.2.3. Online Payment Gateway Integration

To enhance financial transactions within the system, integrating online payment gateways such as Momo, ZaloPay, PayPal, and QR Banking will be a priority. This will allow customers to make digital payments seamlessly, reducing reliance on cash transactions and improving security. Additionally, a digital invoice system will be incorporated to facilitate electronic billing and record-keeping.

5.2.4. Enhanced Security Measures

With increasing concerns about data privacy and cybersecurity, implementing advanced encryption protocols and multi-factor authentication (MFA) will be a key focus. Future updates will include:

Role-Based Access Control (RBAC) - Restricting system access based on user roles (employees vs. managers) to prevent unauthorized modifications.

Data Encryption - Protecting sensitive customer and financial data using industry-standard encryption methods.

Finally, Regular Security Audits - Conducting periodic security assessments to identify vulnerabilities and mitigate risks.

REFERENCES

[1] Nataliej. (2020, November 14). Phân tích và thiết kế hệ thống quản lý quán Internet [Slide show]. SlideShare. https://fr.slideshare.net/slideshow/phn-tch-v-thit-k-h-thng-qun-l-qun-internet/239257042?utm

[2] Top các phương pháp phát triển phần mềm phổ biến. (n.d.). GrowUpWork – Đào Tạo Kỹ Năng Và Giới Thiệu Việc Làm Tại Nhật Bản. https://growupwork.com/blog/kien-thuc-ky-thuat/top-cac-phuong-phap-phat-trien-phan-mem-pho-bien-499?utm

[3] Hari. (2008, October 19). Software design specification for smart Internet cafe [Slide show]. SlideShare. https://fr.slideshare.net/slideshow/software-design-specification-for-smart-internet-cafe-presentation/667977?utm

[4] Best Internet Cafe Software Full Guide |. (2025, February 24). SENET. https://senet.cloud/en/blog/best-internet-cafe-software?utm

[5] Tyrsina, R. (2023, October 4). 5 Best Internet & Gaming Cafe Software [Management, Monitoring]. Windows Report. https://windowsreport.com/internet-cafe-software/?utm

[6] Ag, I. T. (n.d.). CY8CKIT-028-SENSE - Infineon Technologies. Copyright Infineon Technologies AG - All Rights Reserved. https://www.infineon.com/cms/en/product/evaluation-boards/cy8ckit-028-sense/

[7] Verma, Y., & Verma, Y. (2022, February 23). Internet service provider project on Java MySQl | ProjectWorlds. Projectworlds | All Type Software Project Available Free or Paid. https://projectworlds.in/internet-service-provider-project-on-java-mysql/

[8] Internet Cafe system. (n.d.). SourceCodester. https://www.sourcecodester.com/visual-basic-net/4250/internet-cafe-system.html

[9] Verma, Y., & Verma, Y. (2022b, February 23). Internet service provider project on Java MySQl | ProjectWorlds. Projectworlds | All Type Software Project Available Free or Paid. https://projectworlds.in/internet-service-provider-project-on-java-mysql/

APPENDIX

Appendix A: System Requirements

Hardware Requirements:

Processor: Intel Core i5 or higher

RAM: 8GB or more

Storage: Minimum 256GB SSD

Operating System: Windows 10/11, Linux (Ubuntu), macOS

Network: Stable internet connection for updates and cloud synchronization

Software Requirements:

Programming Language: Python 3.9+

GUI Framework: PyQt6

Database: SQLite/MySQL

Development Tools: PyCharm, Qt Designer

Libraries: Pandas, NumPy, Matplotlib, TensorFlow (for future AI integration)

Appendix B: User Roles and Permissions

Employee:

Login/logout

Assign computers to customers

Process food and beverage orders

Generate customer invoices

Manager:

View real-time revenue reports

Manage employee shifts

Edit menu items and pricing

Monitor customer session activities

Approve and review invoices