

MINISTRY OF EDUCATION AND TRAINING  
NHA TRANG UNIVERSITY  
FACULTY OF INFORMATION TECHNOLOGY



**FINAL PROJECT REPORT**

**SEN HONG PRIVATE KINDERGARTEN MANAGEMENT  
SYSTEM**

**Instructor guides:** Master/Lecturer Bùi Chí Thành

**Implementation group:** Cao Linh Hà

Phạm Tuấn Kiệt

Nguyễn Hiếu Quyên

Nguyễn Hồ Thanh Bình

**Class:** 64.CNTT-1

Khánh Hòa – 2025

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# I. PROJECT OUTLINE

## 1. Project information

- Project name: "Sen Hong Private Kindergarten Management System".
- Host unit: Faculty of Information Technology, Nha Trang University.
- Project manager: Cao Linh Hà.
- Project team members: Cao Linh Hà, Nguyễn Hồ Thành Bình, Phạm Tuấn Kiệt, Nguyễn Hiếu Quyên.
- Company: Maytech Solutions.
- Project start date: March 1, 2025.
- Project end date: May 30, 2025.
- Days off: April 07, 2025, April 30, 2025, May 01, 2025.
- Work schedule:
  - + Five working days per week (Monday to Friday).
  - + Eight working hours per day.
- Project budget: 75,000,000 VND.

## 2. Project necessity

Information technology is transforming the way we live and work, particularly in education. In preschools, where every moment is crucial to children's development, the application of technology not only enhances management efficiency but also creates a more modern, safe, and friendly learning environment.

However, in reality, many preschools today still rely on manual recording, paper-based record storage, or simple spreadsheets for management. This approach is time-consuming and prone to errors in tracking student information, teacher management, attendance, meal planning, and organizing daily activities. As schools continue to expand, traditional methods are no longer sufficient to meet actual needs, directly affecting the quality of teaching and child care.

Sen Hong Kindergarten is facing similar challenges, as its management still relies primarily on traditional methods, making it difficult to store and process information quickly and accurately. In particular, with the increasing number of children, managing attendance, health records, menus, and communication between parents and the school has become increasingly complex. A specialized system is needed to ensure more efficient and transparent operations.

Recognizing this issue, our team - students from Nha Trang University - realized the necessity of developing a smart management system for Sen Hong Kindergarten. With the rapid advancement of software technology, particularly web platforms, databases, and cloud computing, this system will help automate administrative processes, optimize resources, and strengthen the connection between teachers, parents, and the school. Features such as real-time child information updates, health monitoring, tuition management, and personalized teaching planning can all be implemented efficiently and accurately, contributing to a more professional and modern educational environment.

Developing the Sen Hong Kindergarten management system is not just a research project but also a practical solution to modernizing management processes and improving the quality of child care and education. This is more than just a technological application - it is a crucial step toward building an advanced preschool education system where every child is nurtured, develops comprehensively, and receives the best possible care from both family and school.

### **3. Project goals and scope**

#### **3.1 Project goals**

Sen Hong Kindergarten is a quality educational environment, nurturing future generations in a safe, modern, and friendly learning space. With the motto "Love - Responsibility - Creativity", the school always focuses on comprehensive development for children, from knowledge and skills to physical and emotional development.

Currently, the school has 70 students, divided into 4 classes according to age, ensuring that the curriculum is appropriate for each stage of child development. The

dedicated, experienced teaching staff and professional personnel system always accompany the children on their journey of discovery and learning.

Besides the standard curriculum, Sen Hong also pays attention to nutrition, extracurricular activities, and close connection with parents, helping children develop in a comprehensive, loving, and joyful educational environment.

The main objective of this project is to build a management system for Sen Hong Kindergarten, helping to optimize management processes, ensuring that school operations are efficient, transparent, and modern. At the same time, the system can be expanded and applied to other kindergartens in the future.

❖ Functions serving user groups include:

- Administrator (Principal):

- Authorize and manage the entire system.
- Approve teaching plans created by the Vice Principal.
- Manage and evaluate teachers, staff.
- Approve finances, view income and expenditure reports from the Accountant.
- General management of students, facilities, school security.
- View the school's overview report (attendance, menu, children's learning situation, parent feedback, ...).

- Professional management (Vice Principal):

- Create and manage teaching plans for each class.
- Assign teachers to each class.
- Monitor students' learning situation.
- Manage teachers, support teaching.
- Monitor extracurricular activity schedules, study programs.

- Financial management (Accounting):

- Manage tuition collection, other contributions.
- Calculate salaries, bonuses, allowances for teachers and staff.
- Prepare periodic financial reports for the Principal.
- Manage school operating costs (kitchen, maintenance, teaching materials, etc.).

- Send tuition reminders to parents.

- Teachers:

- Manage the classroom, take attendance of students.
- Teach according to the plan.
- Monitor and update health status.
- Record status of teaching equipment.
- Feedback information to parents.

- Support staff (security, janitors, kitchen staff):

+ Kitchen staff:

- Manage daily/weekly nutritional menus.
- Update kitchen ingredient status.

+ Security:

- Control school entry and exit.
- Monitor the list of people picking up and dropping off students.

+ Janitors:

- Manage classroom and campus cleanliness.
- Track cleaning schedules, ensure a clean environment.

- Parents:

- View information about children (class schedule, attendance, daily activities).
- Receive notifications from the school (class schedule, menu, events, ...)
- Receive notifications & pay tuition online.
- Send feedback, exchange with teachers via the system.

### **3.2 Project scope**

- Content: The website system helps manage preschool activities, including student management, teacher and staff management, meal planning, class schedules, tuition collection, and parent communication. Additionally, the system supports managing news, event articles, and information related to educational activities.

- Scope: The system is developed for Sen Hong Kindergarten (Dien Son Commune, Dien Khanh District, Khanh Hoa Province), with the potential for expansion to other preschools in the future.
- Timeframe: The project will be carried out over three months, from March 1, 2025, to May 30, 2025.

## **4. Software function**

### **4.1 Business functions**

- Managing staff:
  - Looking up information of staff:
    - Description: Show basic information of all teachers, staff, ... Allows searching by multiple criteria (ID, name, gender, role...).
    - Users: Administrator (Principal), Professional Manager (Vice Principal).
  - Viewing details of staff information:
    - Description: Display personal information, work history, class/department in charge.
    - Users: Administrator (Principal), Professional Manager (Vice Principal).
  - Viewing personal information:
    - Description: View your details, including work schedule, salary information, and work.
    - Users: Anyone.
  - Managing accounts:
    - Description: Users update their account information, change their personal account passwords to keep their information confidential.
    - Users: Anyone.
  - Managing staff:
    - Description: Add, edit, or delete information about teachers and staff.
    - Users: Administrator (Principal).
- Managing business calendar:
  - Shifting assignment:
    - Description: Assign daily/weekly shifts to teachers, kitchen staff, security guards, and housekeepers.

- Users: Administrator (Principal).
- Adjusting and changing of shift:
  - Description: Support adjustment and shift change if necessary.
  - Users: Administrator (Principal), Professional Manager (Vice Principal).
- Tracking and monitoring shifts:
  - Description: Track attendance by day to support payroll calculation.
  - Users: Financial management (Accounting).
- Viewing shifts:
  - Description: See your own working time.
  - Users: Anyone.
- Managing student and their parents:
  - Looking up information about students or their parents:
    - Description: Displays a list of students with personal information (including parents). Allow search by student code, full name, age, grade.
    - Users: Administrator (Principal), Professional Manager (Vice Principal), teacher.
  - Viewing student profile details:
    - Description: Display personal information, attendance history, health status of students.
    - Users: Administrator (Principal), Professional Manager (Vice Principal), teacher.
  - Managing attendance:
    - Description: Track each student's attendance status.
    - Users: Teacher.
  - Managing student's health:
    - Description: Record health status monthly/periodically, special notes on allergies or pathologies.
    - Users: Professional Manager (Vice Principal), teacher.
- Managing education plan:
  - Lesson planning:
    - Description: Create and edit weekly/monthly lesson plans for each class.
    - Users: Professional Manager (Vice Principal).

- Approving lesson plan:
  - Description: Review and approve instructional plans prior to implementation.
  - Users: Administrator (Principal).
- Managing extracurricular activities:
  - Description: Create a calendar of extracurricular activities, keep track of participation lists.
  - Users: Professional Manager (Vice Principal).
- Managing financial:
  - Managing tuition fee:
    - Description: Monitor and update the status of tuition collection of each student.
    - Users: Financial management (Accounting).
  - Managing employee payroll:
    - Description: Calculate teacher and employee salaries according to the shift tracking table.
    - Users: Financial management (Accounting).
  - Preparing financial statements:
    - Description: Export periodic revenue and expenditure reports.
    - Users: Financial management (Accounting).
  - Submitting tuition notices:
    - Description: Send a reminder message to parents to pay tuition fees.
    - Users: Financial management (Accounting).
- Managing kitchen and hygiene:
  - Preparing nutritional menu:
    - Description: Create daily/weekly menus according to children's nutritional needs.
    - Users: Kitchen staff, Professional Manager (Vice Principal).
  - Tracking food ingredients (Incoming Ingredients):
    - Description: Check food inventory and report ingredient status.
    - Users: Kitchen staff.
  - Managing school hygiene:

- Description: Record cleaning schedules and monitor classroom cleanliness levels.
  - Users: Janitorial staff.
- Managing equipment:
  - Description: Manage teaching equipment such as desks, chairs, boards, cabinets, toys, etc.
  - Users: Administrator (Principal), teachers, support staff.
- Managing security:
  - Managing school entry and exit:
    - Description: Track the list of individuals picking up and dropping off children, ensuring safe entry and exit.
    - Users: Security personnel.
  - Recording security incidents:
    - Description: Store information about incidents occurring within the school.
    - Users: Security personnel, Administrator (Principal).
- Interacting with parents:
  - Sending notifications:
    - Description: Send announcements regarding class schedules, extracurricular activities, and menus.
    - Users: Professional Manager (Vice Principal), teacher.
  - Handling parents feedback:
    - Description: Parents send feedback messages and ask questions about their children's status.
    - Users: Parents, teacher, Professional Manager(Vice Principal).
  - Paying online tuition:
    - Description: Pay tuition fees online through the system.
    - Users: Parents.

## **4.2 System functions**

- User management and authorization:
  - Log in/log out of the system.

- Role-based access control (Principal, Vice Principal, Teacher, Accountant, Kitchen Staff, Security Guard, Janitor, Parents).
- Password recovery.
- Manage personal account information.

- Data management:

- Store personnel information.
- Store students and parents information.
- Store work schedule/shift information.
- Store financial data (tuition fees, salaries).
- Store teaching plan information.
- Store student health information.
- Store attendance information.

- Search and query:

- Search personnel information based on criteria.
- Search students/parents information.
- Retrieve financial reports.
- Retrieve work schedules.

- Business processing :

- Calculate salaries based on attendance records.
- Calculate tuition fees.
- Process online payments.
- Manage kitchen inventory.

- Notifications and reminders:

- Send tuition fee notifications.
- Send notifications about class schedules and extracurricular activities.
- Send menu notifications.

- Reports and statistics:

- Generate periodic financial reports.
- Generate attendance reports.
- Generate student health reports.

- Generate security and incident reports.
- User interface management:
- Display relevant information based on user roles.
  - Display notifications and alerts.
  - Display input forms for different functions.

- Communication and contact:

- Messaging system between teachers and parents.
- Receive feedback from parents.
- Provide responses to parents.

### **4.3 Non-functional requirements**

- The system is easy to use, and effective for users.
- User-friendly, eye-catching interface and easy to use with employees.
- The language used is Vietnamese in accordance with the profession.
- The system works on all devices with an internet connection.
- Ensuring data security.

### **5. Estimates and schedule**

- Feasibility study: 3 days.
- System analysis: 25 days.
- System design: 17 days.
- Software development: 33 days.
- Testing: 10 days.
- Training, Transfer: 7 days.
- Maintenance: 8 days.
- Estimated budget: 140,080,000 VND.
- Including:

Employee salary:	132,080,000 VND
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Hosting & Domain name cost:	2,000,000 VND
Office Training:	1,000,000 VND
Incident handling cost:	3,000,000 VND
System update and upgrade cost:	2,000,000 VND

## II. ORIGINAL PLAN

### 1. Human Resources Information

#### 1.2 Personnel structure

- Project manager: Cao Linh Ha
- Personnel allocation:

**Table 2.1. Personnel Allocation Table**

No.	Name	Analysis	Design	Development	Testing
1	Cao Linh Hà	Main	Support	Support	Support
2	Nguyễn Hồ Thanh Bình	Support	Main	Support	Support
3	Phạm Tuấn Kiệt	Support	Support	Main	Support
4	Nguyễn Hiếu Quyên	Support	Support	Support	Main

#### 1.3 Personnel profile

*Cao Linh Hà (Project Manager and Analyst)*

<p><b>Cao Linh Hà</b></p> <p>Địa chỉ (Phone) 03xxxxxxxx (Email) xxxx@ntu.edu.vn</p>	
<b>SKILL</b>	

<ul style="list-style-type: none"> <li>✓ Programming languages: C/C++, C#, Python, SQL Server, ASP.Net,...</li> <li>✓ HTML/CSS with Bootstrap</li> <li>✓ Canva</li> </ul>	<ul style="list-style-type: none"> <li>✓ Teamwork skills</li> <li>✓ Presentation skills</li> <li>✓ Leadership skills</li> <li>✓ Time management skills</li> <li>✓ Word processing and PowerPoint skills</li> </ul>
<b>EXPERIENCE</b>	
<ul style="list-style-type: none"> <li>✓ Third-year student majoring in Software Technology at Nha Trang University</li> <li>✓ Study, research and develop some software: <ul style="list-style-type: none"> <li>- ChangTea Bubble Tea Shop Management Website</li> <li>- Information Technology Faculty Volunteer Team Management Website</li> <li>- Personal Budget Management Application (desktop)</li> <li>- Application of data compression according to Burrows-Wheeler algorithm for text files (desktop)</li> </ul> </li> </ul>	
<b>CERTIFICATIONS - AWARDS</b>	
<ul style="list-style-type: none"> <li>✓ Outstanding Student of the IT Faculty, Academic Year 2022-2023</li> <li>✓ Excellent Student of the IT Faculty, Academic Year 2023-2024</li> <li>✓ Certificate of Achievement – Third Prize in the IT Challenge Competition, Academic Year 2022-2023</li> <li>✓ Certificate of Completion: Basic Cybersecurity Course</li> </ul>	
<b>HOBBIES</b>	
<ul style="list-style-type: none"> <li>✓ Travelling</li> <li>✓ Watching movies</li> <li>✓ Listening to music</li> <li>✓ Playing badminton</li> </ul>	

*Phạm Tuấn Kiệt (Programmer)*

# Phạm Tuấn Kiệt

Địa chỉ

(Phone) 03xxxxxxxx

(Email) xxxx@ntu.edu.vn



## SKILL

- ✓ Programming languages:  
C/C++, C#, Python, SQL Server,  
ASP.Net,...
- ✓ HTML/CSS with Bootstrap
- ✓ CMS: WordPress
- ✓ Editor

- ✓ Teamwork skills
- ✓ Presentation skills
- ✓ Listening skills
- ✓ Eager to learn and ready to complete tasks
- ✓ Time management and effective planning  
skills
- ✓ Document Drafting and PowerPoint Skills

## EXPERIENCE

- ✓ Third-year student at Nha Trang University
- ✓ Studying, researching, and developing software and games
  - 3K Coffee Management Software
  - Gas Leak Warning System
  - ChangTea Bubble Tea Shop Management Website
  - NTU – InFoTech Club Management Website
  - Game BreakOut
  - Sorting Algorithm Simulation Software
- ✓ Participation in Teaching Support at the InfoTech Club

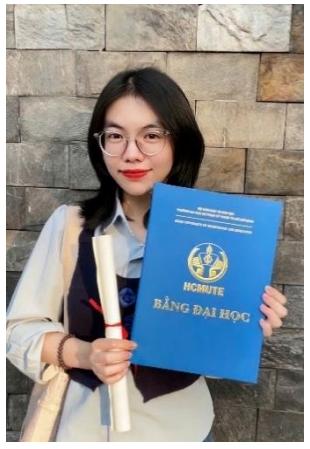
## CERTIFICATIONS - AWARDS

- ✓ Outstanding Student of the IT Faculty for the 2023-2024 Academic Year
- ✓ Certificate of Participation in Green Sunday Activities
- ✓ Certificate of Participation in Volunteer Activities of IT Volunteer Team

- Certificate of Completion: Basic Cybersecurity Course

## ***HOBBIES***

- Playing games 
- Watching movies 
- Listening to music 
- Playing Badminton 

<h1>Nguyễn Hồ Thành Bình</h1> <p>Địa chỉ (Phone) 07xxxxxxxx (Email) xxxx@ntu.edu.vn</p>		
<b>SKILL</b>		
<ul style="list-style-type: none"><li>✓ Programming languages: C/C++, C#, Python, SQL.</li><li>✓ Database management system: SQL Server.</li><li>✓ Web development: HTML/CSS with bootstrap, ASP.Net</li><li>✓ Design tools: Canva</li></ul>		<ul style="list-style-type: none"><li>✓ Teamwork skills</li><li>✓ Time management skills</li><li>✓ Communication skills</li><li>✓ Presentation skills</li><li>✓ Problem-solving skills</li><li>✓ Decision-making skills</li><li>✓ Adaptability and flexibility</li><li>✓ Eager to learn and ready to complete tasks</li></ul>
<b>EXPERIENCE</b>		
<ul style="list-style-type: none"><li>✓ Third-year student at Nha Trang University</li><li>✓ Researching, and developing software, and games<ul style="list-style-type: none"><li>- To-do list website</li><li>- To-do list application(desktop)</li><li>- Book management system website</li><li>- Bagels game</li></ul></li></ul>		
<b>CERTIFICATIONS - AWARDS</b>		
<ul style="list-style-type: none"><li>✓ Outstanding Student of the IT Faculty, Academic Year 2022-2023</li><li>✓ Outstanding Student of the IT Faculty, Academic Year 2023-2024</li></ul>		

- |   |
|---|
| <ul style="list-style-type: none"> <li>✓ Certificate of Achievement – Third Prize in the IT Challenge Competition, Academic Year 2022-2023</li> <li>✓ Certificate of Participation in Volunteer Activities of IT Volunteer Team</li> <li>✓ Certificate of Completion: Basic Cybersecurity Course</li> </ul> |
|---|

<b>HOBIES</b>
---------------

- |   |
|---|
| <ul style="list-style-type: none"> <li>✓ Traveling</li> <li>✓ Listening to music</li> <li>✓ Photo and video editing</li> <li>✓ Playing badminton</li> </ul> |
|---|

*Nguyễn Hiếu Quyên (Tester)*

# Nguyễn Hiếu Quyên

Địa chỉ

(Phone) 03xxxxxxxx

(Email) [xxxx@ntu.edu.vn](mailto:xxxx@ntu.edu.vn)



## SKILLS

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>✓ Programming Languages: C#, C/C++, ASP.NET, SQL Sever, Python...</li> <li>✓ HTML5/CSS3 with Bootstrap</li> <li>✓ Canva</li> </ul> | <ul style="list-style-type: none"> <li>✓ Teamwork skills</li> <li>✓ Text editing skills</li> <li>✓ Listening skills</li> <li>✓ Time management skills</li> <li>✓ Leadership skills</li> </ul> |
|---|---|

## EXPERIENCE

- |  |
|--|
| <ul style="list-style-type: none"> <li>✓ Third-year student at Nha Trang University</li> </ul> |
|--|

## CERTIFICATIONS - AWARDS

- |  |
|--|
| <ul style="list-style-type: none"> <li>✓ Certificate of Participation in Green Sunday Activities</li> <li>✓ Certificate of Participation in Volunteer Activities of IT Volunteer Team</li> </ul> |
|--|

<input checked="" type="checkbox"/> Certificate of Completion: Basic Cybersecurity Course
<b>HOBBIES</b>
<input checked="" type="checkbox"/> Watching movies
<input checked="" type="checkbox"/> Listening to music
<input checked="" type="checkbox"/> Playing Badminton, Soccer
<input checked="" type="checkbox"/> Go backpacking

## 2. Project Planning

### 2.1 Project Information

- Title: Final Project Report
- Subject: Management of Sen Hong private kindergarten
- Author: Group 5
- Company: MayTech Solutions
- Project start date: 01/03
- Working schedule:
  - + 6 working days a week (Monday → Saturday).
  - + 8 working hours a day:
    - Morning: 7:30 AM ÷ 11:30 AM
    - Afternoon: 1:30 PM ÷ 5:30 PM
  - + Closed on April 7 (Hung King's Death Anniversary), April 30, May 1 (Holiday)

### 2.2. Project Plan

**Table 2.2. Sen Hong Kindergarten Project Management Plan**

No.	Work	Time (days)	Preceding Activities	Resources
1	<b>1. Survey the current status of the system</b>			
	1.1 System survey	3	-	Nguyễn Hiếu Quyên

	1.2 Assess the current status of the system	2	-	Cao Linh Hà
2	<b>2. System analysis</b>		1	
	2.1 Identify requirements	5	1.1, 1.2	Nguyễn Hồ Thanh Bình
	2.2 Analyze requirements	10	2.1	Phạm Tuấn Kiệt, Cao Linh Hà, Nguyễn Hồ Thanh Bình, Nguyễn Hiếu Quyên
	2.3 Synthesize requirements	2	2.2	Cao Linh Hà
	2.4 Describe the business	3	2.3	Nguyễn Hiếu Quyên, Nguyễn Hồ Thanh Bình
	2.5 Build a diagram	5	2.4	Phạm Tuấn Kiệt, Nguyễn Hồ Thanh Bình, Cao Linh Hà, Nguyễn Hiếu Quyên
3	<b>3. System Design</b>		2	
	3.1 Functional Design	7	2.5	Phạm Tuấn Kiệt, Nguyễn Hồ Thanh Bình, Cao Linh Hà, Nguyễn Hiếu Quyên
	3.2 Logical Database Design	6	3.1	Cao Linh Hà
	3.3 Physical Database Design	5	3.1	Nguyễn Hiếu Quyên
	3.4 Processing Design	7	3.1	Phạm Tuấn Kiệt
	3.5 Interface Design	10	3.1	Nguyễn Hồ Thanh Bình
4	<b>4. System settings</b>		3	
	4.1 Setting up admin (Principal) functions	10	3.5	Phạm Tuấn Kiệt
	4.2 Setting up personnel management functions	10	3.5	Cao Linh Hà
	4.3 Setting up student management functions	15	3.5	Nguyễn Hồ Thanh Bình

	4.4 Setting up parent management functions	2	4.3	Nguyễn Hồ Thanh Bình
	4.5 Setting up classroom management functions	2	3.5	Nguyễn Hiếu Quyên
	4.6 Setting up teaching management functions	8	4.1	Nguyễn Hiếu Quyên
	4.7 Setting up extracurricular activities management functions	3	4.5	Nguyễn Hiếu Quyên
	4.8 Setting up expenditure management functions	15	4.6	Phạm Tuấn Kiệt
	4.9 Setting up menu management functions	5	4.2	Cao Linh Hà
5	<b>5. Testing and debugging</b>		4	
	5.1 Testing the admin (Principal) function	3	4.9	Cao Linh Hà
	5.2 Testing the personnel management function	2	4.9	Phạm Tuấn Kiệt
	5.3 Testing the student management function	3	4.9	Nguyễn Hiếu Quyên
	5.4 Testing the parent management function	1	5.3	Nguyễn Hiếu Quyên
	5.5 Testing the classroom management function	1	4.9	Nguyễn Hồ Thanh Bình
	5.6 Testing the teaching management function	2	5.1	Cao Linh Hà
	5.7 Testing the extracurricular activities management function	1	5.5	Nguyễn Hồ Thanh Bình
	5.8 Testing the expense management function	5	5.6	Cao Linh Hà
	5.9 Testing the menu management function	2	5.2	Nguyễn Hiếu Quyên
6	<b>6. Training and transfer</b>		5	
	6.1 Writing the manual	2	5.9	Cao Linh Hà, Nguyễn Hồ Thanh Bình
	6.2 Handing over the product	1	6.1	Cao Linh Hà
	6.3 Training on use	2	6.2	Phạm Tuấn Kiệt, Nguyễn Hiếu Quyên

	6.4 Obtaining investor signature confirmation	1	6.3	Cao Linh Hà
	6.5 Project summary report	1	6.4	Phạm Tuấn Kiệt, Nguyễn Hồ Thanh Bình, Cao Linh Hà, Nguyễn Hiếu Quyên
7	<b>7. Maintenance</b>		6	
	7.1 System Troubleshooting	5	6.5	Phạm Tuấn Kiệt, Cao Linh Hà
	7.2 System Updates and Upgrades	3	7.1	Nguyễn Hồ Thanh Bình, Nguyễn Hiếu Quyên

### 2.3 Check Project Progress

- Work 1 Survey the current status of the system is 100% complete.
- Work 2.1 Identify requirements, work 2.2 Analyze requirements, work 2.3 Synthesize requirements is 100% complete.

### 2.4 Project Resources

**Table 2.3. Project Resources**

No.	Resource Name	Type	Material Label	Standard price
1	Cao Linh Hà	Work		65000 VND/hr
2	Phạm Tuấn Kiệt	Work		65000 VND/hr
3	Nguyễn Hiếu Quyên	Work		65000 VND/hr
4	Nguyễn Hồ Thanh Bình	Work		65000 VND/hr
5	Hosting & Domain name	Cost		2000000 VND
6	Office Training	Cost		1000000 VND
7	Incident handling cost	Cost		3000000 VND
8	System update and upgrade cost	Cost		2000000 VND

### 3. Scheduling on MS Project software

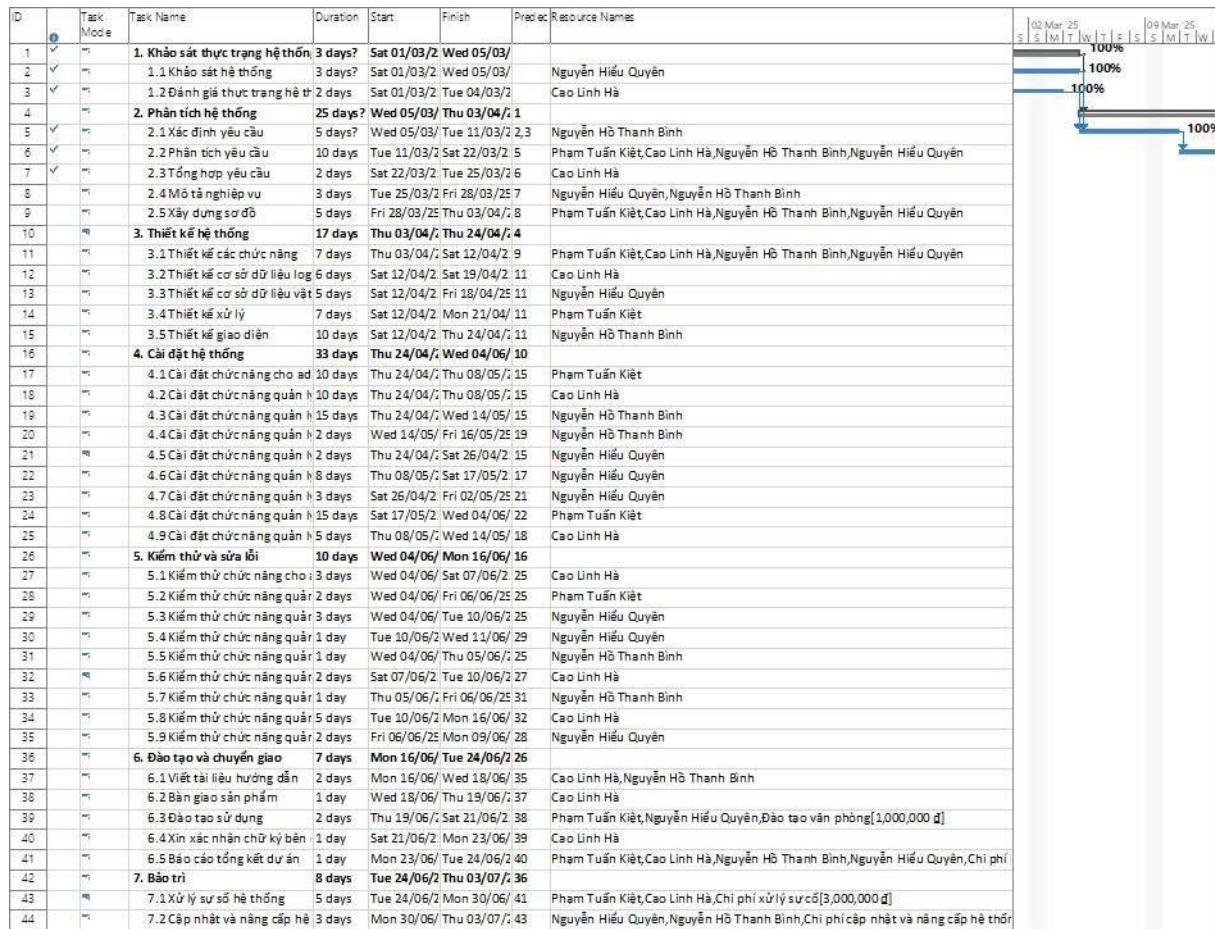
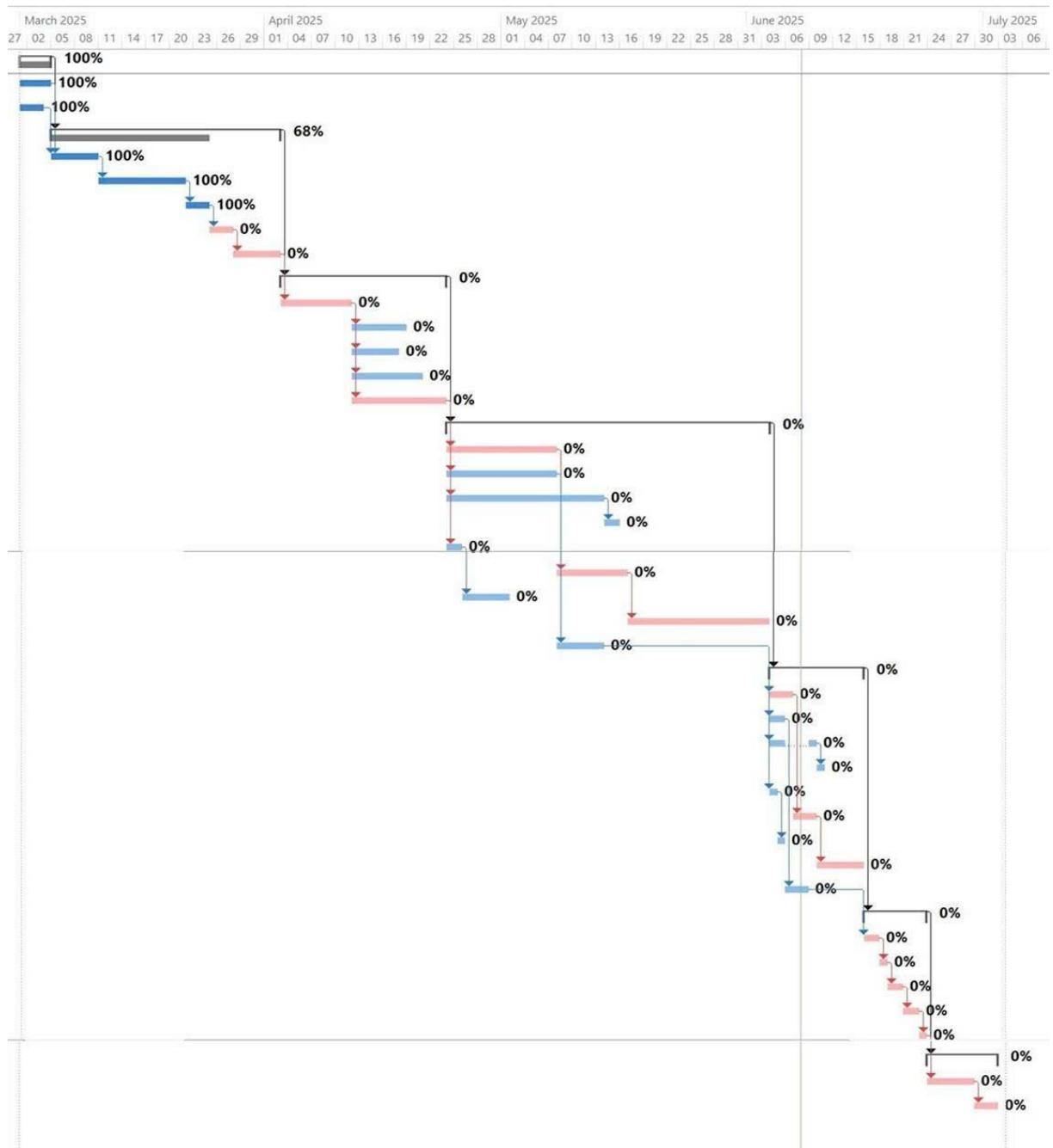


Figure 2.1. Project Task and Resource Schedule (Gantt View)



**Figure 2.2. Project Gantt Chart Showing Task Progress and Dependencies**

ID	①	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Code
1		Nguyễn Hiếu Quyên	Work		N		100%	65,000 ₫/hr	0 ₫/hr	0 ₫	Prorated	Standard	
2		Cao Linh Hà	Work		C		100%	65,000 ₫/hr	0 ₫/hr	0 ₫	Prorated	Standard	
3		Nguyễn Hồ Thành Bình	Work		N		100%	65,000 ₫/hr	0 ₫/hr	0 ₫	Prorated	Standard	
4		Phạm Tuấn Kiệt	Work		P		100%	65,000 ₫/hr	0 ₫/hr	0 ₫	Prorated	Standard	
5		Đào tạo văn phòng	Cost		D						Prorated		
6		Chi phí hosting và tên miền	Cost		C						Prorated		
7		Chi phí xử lý sự cố	Cost		C						Prorated		
8		Chi phí cập nhật và nâng cấp hệ thống	Cost		C						Prorated		

**Figure 2.3. Project Resource Sheet with Standard Hourly Rates**

## **4. System Architecture**

### **4.1 Overview of SQL Server Database Management System**

A Database Management System (DBMS) is software designed to manage databases, enabling the creation of databases for various applications and controlling all access to those databases. In other words, a DBMS allows for the definition (specifying data types, structure, constraints), creation (storing data on memory devices), and manipulation (querying, updating, exporting, etc.) of databases for different applications.

Microsoft introduced SQL Server as a product primarily developed for data storage purposes. In addition, SQL Server provides several features to help users work more efficiently, including:

- Ensures durable data storage, preventing data loss.
- Allows for the creation and storage of large amounts of data.
- Supports data analysis using SSAS (SQL Server Analysis Services).
- Provides high-level data security.
- Facilitates report creation using SSRS (SQL Server Reporting Services).

### **4.2 Overview of SQL Server Management Studio (SMSS)**

SQL Server Management Studio (SSMS) is a tool provided by Microsoft to manage SQL Server. It serves as a user-friendly interface that simplifies working with SQL Server databases.

First introduced with Microsoft SQL Server 2005, SSMS allows users to query, manage, and design databases. With SSMS, users can create new databases, define tables, and set up constraints such as primary keys, foreign keys, and data integrity rules through a visual interface. The tool integrates a T-SQL editor that enables easy writing, testing, and execution of SQL statements. It also supports syntax checking and code suggestions, helping improve work efficiency.

SSMS also provides robust security management features, including creating and managing user accounts, granting access permissions, and monitoring database activities to ensure data safety. Additionally, it is a useful tool for developers in building

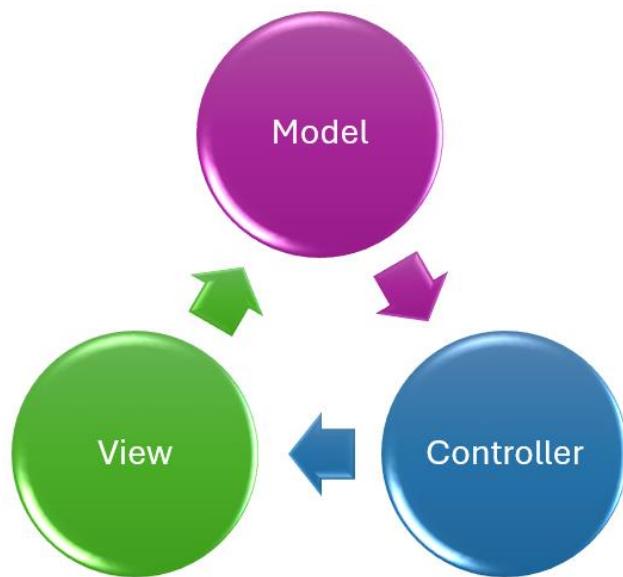
and testing stored procedures, functions, or complex queries, effectively supporting the automation of data processing tasks.

Our team uses SSMS to create the database, define tables and primary key constraints, input sample data, control data integrity, and develop stored procedures to look for staff members information.

### 4.3 MVC Model

#### 4.3.1 Overview of MVC

The MVC architecture pattern stands for Model-View-Controller. It is a design model used in software engineering. MVC is a software architectural pattern for developing user interfaces on computers. It is divided into three interconnected components, each with its own responsibilities and operates independently from the others.



**Figure 2.4. MVC Model (Model - View - Controller)**

#### 4.3.2 Model

The Model represents the components of the application that handle all logic related to the data domain—in short, it is the back-end that contains all the data logic of the application. This data can include information being passed between the View and Controller, or any other data related to the business logic.

When the state of this data changes, the Model typically notifies the View (so that the interface can update accordingly), and sometimes also the Controller (if additional logic is needed to update the View) [1].

#### 4.3.3 View

The View represents the components that display the user interface (UI) of the application. Typically, this UI is generated from the Model's data.

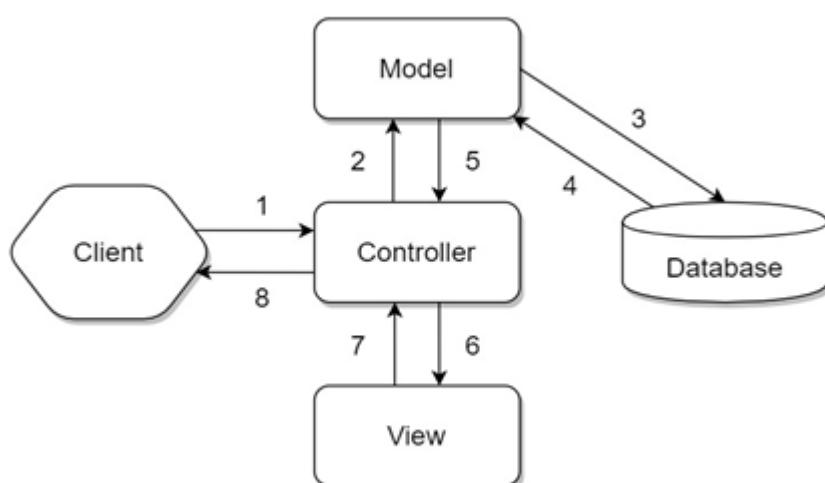
#### 4.3.4 Controllers

The Controller is a part of the application that handles user interactions. It interprets mouse and keyboard input from the user and notifies the Model and View to change accordingly.

The controller is responsible for receiving processing requests from the user. It contains classes/functions that handle various business logic operations to retrieve the correct data using the services provided by the Model, and then displays that data to the user through the View.

The controller sends commands to the model to change its state (e.g., adding a new user or updating a user's name). It also sends commands to the corresponding view to update the view's display.

#### 4.3.5 Processing Flows in MVC



**Figure 2.5. Processing Flows Description in MVC**

First, the client sends a request to the server through the Controller.

The Controller receives the request and determines the next processing flow.

In the case where the request only requires a page transition (without sending or receiving data), the Controller will redirect the browser and end the flow. In this scenario, the flow proceeds in the order: 1 → 6 → 7 → 8.

If the user's request requires data processing, the Controller will call the Model to retrieve the data. The Model then interacts with the database to fetch the data and returns it to the Controller. The Controller then calls the appropriate View, passing the data along. The View injects the data into the HTML and returns the rendered HTML to the Controller. Finally, the Controller returns the result to the browser. In this case, the flow follows: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8.

If the user's request only requires data and not a page transition, the Controller responds directly to the browser through an API, typically returning the data in JSON format. In this scenario, the flow is: 1 → 2 → 3 → 4 → 5 → 8. [2]

## 4.4 ASP.NET MVC Framework

### 4.4.1 Overview of ASP.NET

ASP.NET is an open-source web framework developed by Microsoft. It operates on the Windows platform and began in the early 2000s. ASP.NET allows developers and programmers to create web applications, web services, and dynamic websites.

The first version of ASP.NET, 1.0, was released in January 2002. As of now, ASP.NET 4.6 is the latest released version. ASP.NET was developed to be compatible with the HTTP protocol, which is a standard protocol widely used in all web applications.

ASP.NET is compiled under CLR (Common Language Runtime), which allows developers to write ASP.NET code in any .NET-supported language such as C#, J#, VB.Net, and more. [3]

### 4.4.2 Reasons to Use ASP.NET MVC

ASP.NET MVC includes the following features:

- Inherits the transparency and clear structure of the MVC pattern.

- It is a platform that is both extensible and pluggable.
- Fully supports features such as user authentication mechanisms, membership and role management, output and data caching, session and profile handling, application state management, and configuration system.
- ASP.NET MVC provides a powerful URL routing component, allowing you to build applications with clean, SEO-friendly URLs.
- Easy management of extensions and packages through NuGet.
- Supports view generation using Razor syntax.
- Supports Web API libraries for compatibility across various devices.
- Supports authentication through third-party APIs (e.g., Facebook, Google...), with Bootstrap integrated to assist in UI design.

## 5. Risk Analysis

**Table 2.4. Risk Analysis**

Activity	Threat	Impact [H, M, L]	Likelihood
System Analysis	Inaccurate information from users	H	M
System Design	Inconsistency between functional components	M	M
Software Development	Programming errors, lack of input validation	H	M
System Testing	Incomplete test cases	H	L
System Deployment	Lack of user guidance	M	H
System Maintenance	No follow-up/support after deployment	H	M
Financial Management	Budget overrun due to unplanned expenses	H	L
Parent Communication via System	Parents unfamiliar with technology, may miss notifications	M	M
Menu and Kitchen Ingredient Mgmt.	Ingredients not updated in time, affecting meal quality	M	M
Information Security Management	Student data exposed due to lack of security	H	M

- **H (High):** Severe impact or high likelihood
- **M (Medium):** Moderate impact or likelihood
- **L (Low):** Minor impact or low likelihood

**Impact:** The level of consequence if the risk occurs.

- **H:** Major disruption, affects project timeline or quality
- **M:** Affects some functions, recoverable
- **L:** Minimal effect, does not cause significant obstacles

**Likelihood:** Probability of the risk happening.

- **H:** Highly likely
- **M:** Moderately likely
- **L:** Unlikely

## 6. Test Plan

**Table 2.5. Test Plan**

No	Test case name	Testing step	Data test	Expected result
1	TC_Login_Valid	Access the login page → Enter the correct username and password → Click Login.	username: phuong.ntt@senhong.edu.vn, password: 123	Login successful, redirect to the dashboard
2	TC_Login_Invalid_Password	Correct username, incorrect password entered.	username: phuong.ntt@senhong.edu.vn, password: 124	Display the message: "Incorrect password."
3	TC_Add_Employee_Valid	Access the employee management section → Click "Add Employee" → Enter all valid information → Click "Add."	Last Name, First Name, Gender, Date of Birth, Citizen Identity Card Number, Address, Email, Password, Role Code.	The new employee is saved into the system and displayed in the list.
4	TC_Add_Employee_MissingField	Add an employee but leave the "Full Name" field blank.	Other fields are correct, the "Full Name" field blank.	Display the error message:

			Name" field is left blank.	"Please enter the full name."
5	TC_Add_Student_Valid	Access student management → Add student → Enter all required information → Click "Add."	Last Name, First Name, Gender, Date of Birth, Address, Class Code, Enrollment Date	The student is successfully added and displayed in the list.
6	TC_Add_Student_MissingGender	Add a student without selecting gender.	Other information is valid, but the gender is left unselected.	Display the warning: "Gender must be selected."
7	TC_Search_Employee_By Name	Access the employee list → Type "Nguyễn" into the search box → Click Search.	Keyword: "Nguyễn"	Display the list of employees whose names contain "Nguyễn."
8	TC_Search_Student_ByClass	Go to the student list → Filter by class "4-5 years class"	Choose "4-5 years class" from the dropdown class list.	Display the list of students in class 4-5 years.
9	TC_Attendance_ByClassAndDate_Valid	The teacher accesses the attendance feature → Selects class "4-5 years" and date "06/06/2025" → Selects the attendance status for each student → Clicks "Save."	Class: 4-5 years Date: June 6, 2025	Attendance data is saved, display the message: "Attendance recorded successfully."
10	TC_Attendance_NoClass	The teacher accesses the attendance feature → Selects date "06/06/2025" and without class → Clicks "Take attendance."	Date: June 6, 2025	Display a message: "Choose a class before Taking attendance please"
12	TC_ShiftTracking_Valid	The accountant accesses the	Employee: Chi, Status: Present	Attendance is successfully

		attendance tracking section → Selects the employee and date → Enters the work status (Present, Absent, Late, Excused) → Clicks “Check In.”		recorded and displayed in the table.
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### III. SOFTWARE INSTALLATION

#### 3.1 System Analysis and Design

##### 3.3.1 Data Models and Design

###### 3.3.1.1 Functional Decomposition Diagram

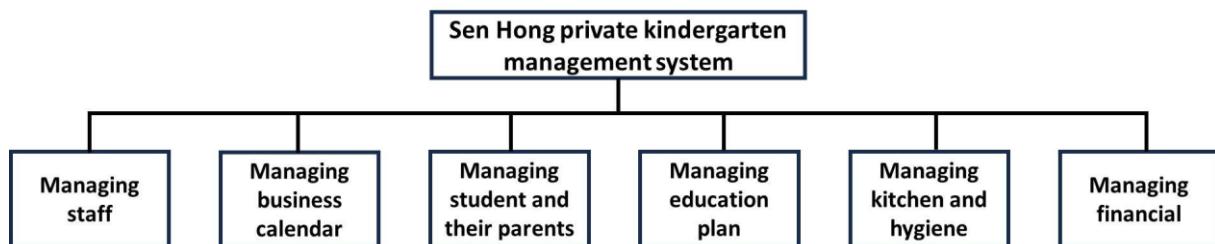


Figure 3.1. FDD of Sen Hong Private Kindergarten Management System

###### 3.3.1.2 Database Diagram

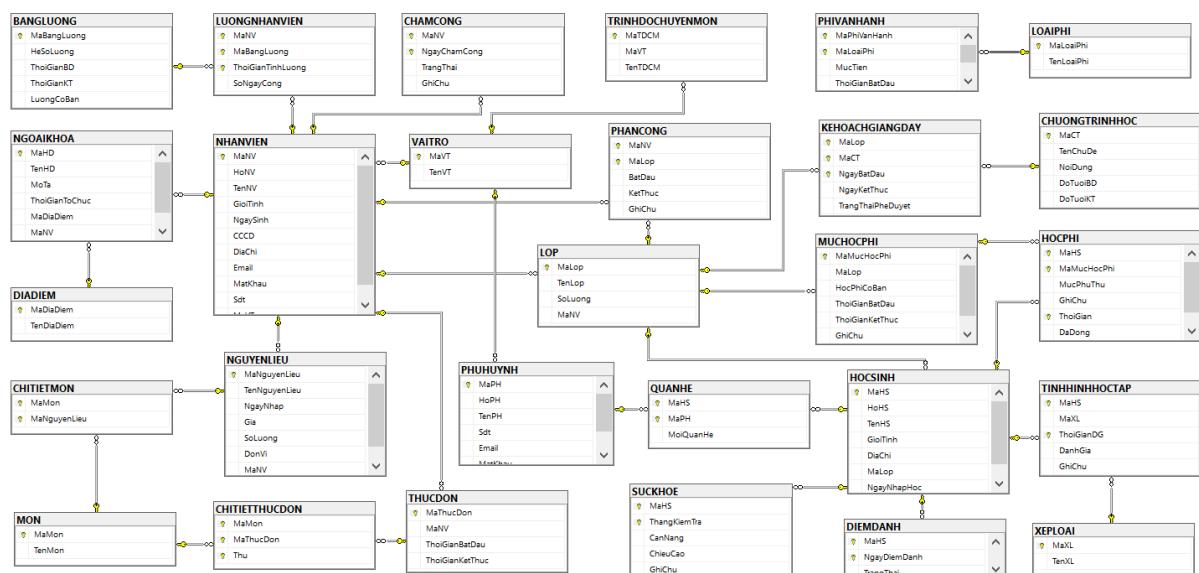


Figure 3.2. Data Diagram

###### 3.3.1.3 Data Tables

Table 3.1. Table VAITRO

Property	Data type	Description	Note
MaVT	varchar	Role ID	Primary key Foreign key of NHANVIEN, PHUHUYNH
TenVT	nvarchar	Role name	

**Table 3.2. Table NHANVIEN**

Property	Data type	Description	Note
MaNV	varchar	Employee ID	Primary key Foreign key of CHAMCONG, LUONGNHANVIEN, LOP, NGOAIKHOA, PHANCONG, THUCDON, NGUYENLIEU
HoNV	nvarchar	Employee last name	
TenNV	nvarchar	Employee first name	
GioiTinh	bit	Sex	
NgaySinh	DateTime	Date of birth	
CCCD	varchar	Citizen identification card	
DiaChi	nvarchar	Address	
Email	varchar	Email	
MatKhau	varchar	Password	
Sdt	varchar	Phone number	
MaVT	varchar	Role ID	Foreign key of VAITRO

**Table 3.3. Table TRINHDOCHUYENMON**

Property	Data type	Description	Note
MaTDCM	varchar	Qualification ID	Primary key
MaVT	varchar	Role ID	Foreign key of VAITRO
TenTDCM	nvarchar	Qualification name	

**Table 3.4. Table CHAMCONG**

Property	Data type	Description	Note
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MaNV	varchar	Employee ID	Primary key Foreign key of NHANVIEN
NgayChamCong	DateTime	Attendance Date	Primary key
TrangThai	bit	Status	
GhiChu	nvarchar	Note	

**Table 3.5. Table BANGLUONG**

Property	Data type	Description	Note
MaBangLuong	varchar	Payroll ID	Primary key Foreign key of LUONGNHANVIEN
HeSoLuong	decimal	Salary Coefficient	
ThoiGianBD	Date	Start Date	
ThoiGianKT	Date	End Date	
LuongCoBan	int	Basic Salary	

**Table 3.6. Table LUONGNHANVIEN**

Property	Data type	Description	Note
MaNV	varchar	Employee ID	Primary key Foreign key of NHANVIEN
MaBangLuong	varchar	Payroll ID	Khóa chính Foreign key of BANGLUONG
ThoiGianTinhLuong	DateTime	Payroll Period	Primary key
SoNgayCong	int	Working Days	

**Table 3.7. Table THUCDON**

Property	Data type	Description	Note
MaThucDon	varchar	Menu ID	Primary key Foreign key of CHITIETTHUCDON
MaNV	varchar	Employee ID	Foreign key of NHANVIEN
ThoiGianBatDau	DateTime	Start Date	
ThoiGianKetThuc	DateTime	End Date	

**Table 3.8. Table MON**

Property	Data type	Description	Note
MaMon	varchar	Dish ID	Primary key Foreign key of CHITIETTHUCDON, CHITIETMON
TenMon	nvarchar	Dish name	

**Table 3.9. Table CHITIETTHUCDON**

Property	Data type	Description	Note
MaMon	varchar	Dish ID	Primary key Foreign key of MON
MaThucDon	varchar	Menu ID	Primary key Foreign key of THUCDON
Thu	nvarchar	Day of week	Primary key

**Table 3.10. Table NGUYENLIEU**

Property	Data type	Description	Note
MaNguyenLieu	varchar	Ingredient ID	Primary key Foreign key of CHITIETMON
TenNguyenLieu	nvarchar	Ingredient Name	
NgayNhap	date	Import Date	
Gia	int	Price	
SoLuong	int	Quantity	
DonVi	nvarchar	Unit	
MaNV	varchar	Employee ID	Foreign key of NHANVIEN

**Table 3.11. Table CHITIETMON**

Property	Data type	Description	Note
MaMon	varchar	Dish ID	Primary key Foreign key of MON
MaNguyenLieu	varchar	Ingredient ID	Primary key Foreign key of NGUYENLIEU

**Table 3.12. Table LOP**

<b>Property</b>	<b>Data type</b>	<b>Description</b>	<b>Note</b>
MaLop	varchar	Class ID	Primary key Foreign key of HOCSINH, MUCHOCPHI, PHANCONG, KEHOACHGIANGDAY
TenLop	nvarchar	Class Name	
SoLuong	int	Number of Students	
MaNV	varchar	Employee ID	Foreign key of NHANVIEN

**Table 3.13. Table HOCSINH**

<b>Property</b>	<b>Data type</b>	<b>Description</b>	<b>Note</b>
MaHS	varchar	Student ID	Primary key Foreign key of QUANHE, HOCPHI, TINHHINHHOCTAP, SUCKHOE, DIEMDANH
HoHS	nvarchar	Student last name	
TenHS	nvarchar	Student first name	
GioiTinh	bit	Gender	
NgaySinh	DateTime	Date of birth	
DiaChi	nvarchar	Address	
MaLop	varchar	Class ID	Foreign key of LOP
NgayNhapHoc	date	Enrollment Date	

**Table 3.14. Table PHUHUYNH**

<b>Property</b>	<b>Data type</b>	<b>Description</b>	<b>Note</b>
MaPH	varchar	Parent ID	Primary key Foreign key of QUANHE
HoPH	nvarchar	Parent last name	
TenPH	nvarchar	Parent first name	
Sdt	varchar	Phone number	
Email	varchar	Email	
MatKhau	varchar	Password	

MaVT	varchar	Rold ID	Foreign key of VAITRO
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**Table 3.15. Table QUANHE**

Property	Data type	Description	Note
MaHS	varchar	Student ID	Primary key Foreign key of HOCSINH
MaPH	varchar	Parent ID	Primary key Foreign key of PHUHUYNH
MoiQuanHe	nvarchar	Relationship to student	

**Table 3.16. Table MUCHOCPHI**

Property	Data type	Description	Note
MaMucHocPhi	varchar	Tuition fee tier ID	Primary key Foreign key of HOCPHI
MaLop	varchar	Class ID	Foreign key of LOP
HocPhiCoBan	int	Base Tuition Fee	
ThoiGianBatDau	date	Start Date	
ThoiGianKetThuc	date	End Date	
GhiChu	nvarchar	Note	

**Table 3.17. Table HOCPHI**

Property	Data type	Description	Note
MaHS	varchar	Student ID	Primary key Foreign key of HOCSINH
MaMucHocPhi	varchar	Tuition fee tier ID	Primary key Foreign key of MUCHOCPHI
MucPhuThu	int	Extra charge ID	
GhiChu	nvarchar	Note	
ThoiGian	date	Tuition payment date	Primary key
DaDong	bit	Tuition payment status	

**Table 3.18. Table XEPMOAI**

Property	Data type	Description	Note
MaXL	varchar	Grade ID	Primary key Foreign key of TINHHINHHOCTAP
TenXL	nvarchar	Grade name	

**Table 3.19. Table TINHHINHHOCTAP**

Property	Data type	Description	Note
MaHS	varchar	Student ID	Primary key Foreign key of HOCSINH
MaXL	varchar	Grade ID	Foreign key of XEPLOAI
ThoiGianDanhGia	DateTime	Evaluation date	
DanhGia	nvarchar	Evaluation	Primary key
GhiChu	nvarchar	Note	

**Table 3.20. Table SUCKHOE**

Property	Data type	Description	Note
MaHS	varchar	Student ID	Primary key Foreign key of HOCSINH
ThangKiemTra	int	Testing month	Primary key
CanNang	decimal	Weight	
ChieuCao	decimal	Height	
GhiChu	nvarchar	Note	

**Table 3.21. Table DIEMDANH**

Property	Data type	Description	Note
MaHS	varchar	Student ID	Primary key Foreign key of HOCSINH
NgayDiemDanh	date	Attendance date	Primary key
TrangThai	bit	Status	
GhiChu	nvarchar	Note	

**Table 3.22. Table DIADIEM**

Property	Data type	Description	Note
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MaDiaDiem	varchar	Location ID	Primary key
TenDiaDiem	nvarchar	Location name	

**Table 3.23. Table NGOAIKHOA**

Property	Data type	Description	Note
MaHD	varchar	Activity ID	Primary key
TenHD	nvarchar	Activity name	
MoTa	nvarchar	Description	
ThoiGianToChuc	date	Event time	
MaDiaDiem	nvarchar	Location ID	Foreign key of DIADIEM
MaNV	varchar	Employee ID	Foreign key of NHANVIEN

**Table 3.24. Table PHANCONG**

Property	Data type	Description	Note
MaNV	varchar	Employee ID	Primary key Foreign key of NHANVIEN
MaLop	varchar	Class ID	Primary key Foreign key of LOP
BatDau	date	Start date	
KetThuc	date	End date	
GhiChu	nvarchar	Note	

**Table 3.25. Table CHUONGTRINHHOC**

Property	Data type	Description	Note
MaCT	varchar	Program ID	Primary key
TenChuDe	nvarchar	Topic name	
NoiDung	nvarchar	Content	
DoTuoiBD	int	Start age	
DoTuoiKT	int	End age	

**Table 3.26. Table KEHOACHGIANGDAY**

Property	Data type	Description	Note
MaLop	varchar	Class ID	Primary key Foreign key of LOP

MaCT	varchar	Program ID	Primary key Foreign key of CHUONGTRINHHOC
NgayBatDau	date	Start date	Primary key
NgayKetThuc	date	End date	
TrangThaiPheDuyet	bit	Approval status	

**Table 3.27. Table LOAIPHI**

Property	Data type	Description	Note
MaLoaiPhi	varchar	Fee type ID	Primary key
TenLoaiPhi	nvarchar	Fee name ID	

**Table 3.28. Table PHIVANHANH**

Property	Data type	Description	Note
MaPhiVanHanh	varchar	Operating fee ID	Primary key
MaLoaiPhi	varchar	Fee type ID	Khoá chính Foreign key of LOAIPHI
MucTien	int	Amount	
ThoiGianBatDau	date	Start date	
ThoiGianKetThuc	date	End date	

### 3.3.1.4 Relationships Between Tables

**Table 3.29. Relationships Between Tables**

Table	Linked to	Relationship	Describe
HOCSINH	LOP	1 – 1	a student is in a class
LOP	HOCSINH	1 – N	a class has many students
HOCSINH	SUCKHOE	1 – N	a student has many healthy reports
SUCKHOE	HOCSINH	1 – 1	a healthy report is of a student
HOCSINH	MUCHOCPHI	1 – N	a student has many stuition fees

MUCHOCPHI	HOCSINH	1 – N	a stuition fee is of many students
HOCSINH	XEPLOAI	1 – N	a student has many grades
XEPLOAI	HOCSINH	1 – N	a grade is of many student
HOCSINH	DIEMDANH	1 – N	a student is in many attendance lists
DIEMDANH	HOCSINH	1 - N	a attendance list has many students
HOCSINH	PHUHUYNH	1 – 1	a student has parent
PHUHUYNH	HOCSINH	1 – N	parent has many students
LOP	CHUONGTRINHHOC	1 - N	a class has many topics
CHUONGTRINHHOC	LOP	1 – N	a topic is of many classes
PHIVANHANH	LOAIPHI	1 - N	Operating fee has a lot of fee's types
MON	NGUYENLIEU	1 - N	a dish has many ingredients
NGUYENLIEU	MON	1 – N	ingredient can be in many dishes
NHANVIEN	BANGLUONG	1 - N	a employee has many salaries
BANGLUONG	NHANVIEN	1 - N	a salary can apply to many staffs
NHANVIEN	CHAMCONG	1 - N	a staff has be in many timesheet
CHAMCONG	NHANVIEN	1 - N	a timesheet has many staffs
NHANVIEN	VAITRO	1 – 1	a student has a role

VAITRO	NHANVIEN	1 – N	a role can have many staffs
THUCDON	MON	1 - N	a menu has many dishes
MON	THUCDON	1 - N	a dish can be in many menus

### 3.3.2 Interface Design

**Table 3.30. Interface Design**

No.	Interface	Function
1	Log in	Log in to the system and save user session information.
2	Homepage	Display basic information about Sen Hong Kindergarten.
3	Employee List and Employee Information Lookup	Display the staff list and search for staff for the roles of Principal and Vice Principal.
4	Add employee	Add an employee to the system.
5	Employee attendance recording	Allow users to record employee attendance by date and role.
6	Display list of employees who have recorded attendance	View the list of employees who have recorded attendance by date.
7	Attendance statistics by time period	View employee attendance statistics over a selected period.
8	Student list and student information lookup	Display the student list and search for students for the roles of Principal, Vice Principal, and Teacher.
11	Add student	Add students to the system.
12	Student attendance	Take daily attendance of students by class.
13	Attendance results	View the list of students who have been marked present.
14	Attendance statistics	View attendance statistics of students.
15	List and lookup of extracurricular activities	Display and search extracurricular activities by name.
16	List of academic programs	Display the list of the school's academic programs.

### **3.3.3 Design of Processing Function**

#### ***3.3.3.1 Authorization Handling Function***

```
Function LoginSenHong>Email, MatKhau) {  
    // Search for nhanvien in NHANVIEN with matching Email and MatKhau  
    if (nhanvien is found) {  
        // Save Email and MatKhau into Session  
        // Navigate based on role  
        switch (MaVT of nhanvien) {  
            If "HT" redirect to "HomeSenHongHT";  
            If "HP" redirect to "HomeSenHongHP";  
            If "GV" redirect to "HomeSenHongGV";  
            If "KT" redirect to "HomeSenHongKT";  
            If "CD" redirect to "HomeSenHongCD";  
            Show message "Invalid employee role.";  
        }  
    }  
    // Search for phuhuynh in PHUHUYNH with matching Email and MatKhau  
    if (phuhuynh is found) {  
        // Save Email and MatKhau into Session  
        if (phuhuynh.MaVT == "PHHS") redirect to "HomeSenHongPH";  
        else Show message "Invalid parent role.";  
    }  
}
```

#### ***3.3.3.2 Employee Registration Function***

```
Function Create(thong_tin_nhan_vien) {
```

```

if(trinh_do_nhan_vien){

    // Check if the qualification matches the selected role

    if (trinh_do_nhan_vien.MaVT != thong_tin_nhan_vien.MaVT) Thông báo “Trình
độ chuyên môn không phù hợp với vai trò đã chọn”

}

if(thong_tin_nhan_vien){

    // Accept all roles except HT, HP, PHHS (Principal/Vice Principal, Parent)

    MaVT != “HT” && “PHHS”

    // Employee ID is generated automatically

    MaNV = LayMaNhanVien()

    Save thong_tin_nhan_vien to the database

    Return display interface

}

Return registration interface with entered information (for user to edit)
}

```

### ***3.3.3.3. Personnel Information Lookup Function***

```

Function TimKiemNV(hoten, gioitinh, vaitro) {

    // Get list of roles (excluding PHHS)

    if (hoten != null || gioitinh != null || vaitro != null) {

        // Execute search using stored procedure NhanVien_TimKiem

        nhanvien = NhanVien_TimKiem @hoten, @gioitinh, @vaitro

        if (no nhanvien found) Show message “Không tìm thấy nhân viên phù hợp!”

    }

    else Show complete list

    Return interface with search results

}

```

### **3.3.3.4 Personnel Timekeeping Processing Function**

Function AttendanceByRole(maVT, ngay)

{

if (maVT == "" || maVT == null)

    return error "Bad Request";

if (ngay == null)

    set ngay = today;

Get list of all employees with role == maVT

Get attendance records with:

    NgayChamCong == selected date and employee role == maVT

Create result list (model):

For each employee in the list:

    Find corresponding attendance record for that employee in the fetched list

    If not found:

        Create new attendance record:

{

    MaNV = nv.MaNV,

    NgayChamCong = selected date,

    TrangThai = false (not yet attended),

    GhiChu = "",

    NHANVIEN = nv

};

    If found:

        dd.NHANVIEN = nv;

Add the attendance record (existing or new) to the result list

```
// Set additional information:  
  
ViewBag.NgayChamCong = ngay.Value;  
  
ViewBag.MaVT = maVT;  
  
ViewBag.TenVT = TenVT;  
  
Return "Attendance" View with the attendance list (model)  
  
}
```

### ***3.3.3.5 Personnel Timekeeping Statistics Function***

```
Function AttendanceResultSelect(maVT, fromDate, toDate)  
  
{  
  
    danhSachVaiTro = GetRoleList(exclude: "Phụ huynh")  
  
    ViewBag.VTs = danhSachVaiTro  
  
    if (maVT == null || fromDate == null || toDate == null)  
  
        return View() // not enough information selected  
  
    nhanViens = GetEmployeesByRole(maVT)  
  
    chamCongTrongKhoang = GetAttendanceByRange(maVT, fromDate, toDate)  
  
    report = []  
  
    ForEach nv in nhanViens {  
  
        danhSachChamCong = chamCongTrongKhoang.FilterByMaNV(nv.MaNV)  
  
        soNgayCoMat = Count(danhSachChamCong, status = true)  
  
        soNgayVang = Count(danhSachChamCong, status = false)  
  
        reportItem = CreateAttendanceReportItem(  
  
            MaNV = nv.MaNV,  
  
            HoTen = nv.HoNV + " " + nv.TenNV,  
  
            SoNgayCoMat = soNgayCoMat,
```

```

SoNgayVang = soNgayVang

)

report.Add(reportItem)

}

ViewBag.TenVT = GetRoleName(maVT)

ViewBag.TuNgay = fromDate

ViewBag.DenNgay = toDate

return View(report)

}

```

### ***3.3.3.6 Student Records Reception Function***

Function themHocSinh(hoten, ten, gioiTinh, diaChi, maLop, ngayNhapHoc, ngaySinh):

```
{

```

Receive input: last name, first name, gender, address, class ID, admission date, date of birth

```
if (ngaySinh == null || ngayNhapHoc == null):
```

```
    AddError(" ✗ Vui lòng nhập đầy đủ Ngày sinh và Ngày nhập học ")
```

```
else:
```

Calculate age in months:

```
years = ngayNhapHoc.Year - ngaySinh.Year
```

```
months = ngayNhapHoc.Month - ngaySinh.Month
```

```
if (ngayNhapHoc.Day < ngaySinh.Day):
```

```
    months -= 1
```

```
    if (months < 0):
```

```
        years -= 1
```

```
        months += 12
```

```

age = years + (months / 12.0)

if (age < 2 || age > 6):
    AddError($"X Tuổi học sinh không hợp lệ: X.Y tuổi (chỉ nhận từ 2 đến 6 tuổi
tại thời điểm nhập học)")

// If no errors (Model is valid)

if (ModelState.IsValid):
    maHocSinh = LayMaHocSinh()

    Save student to the database

    SaveHocSinh(maHocSinh, hoten, ten, gioiTinh, diaChi, maLop, ngayNhapHoc,
ngaySinh)

    RedirectTo("HocSinh/Index")

else:

    // Return to form with existing input and error messages

    return View("HocSinhForm", modelWithErrors)

}

```

### **3.3.3.7 Student Information Lookup Function**

```

Function tim_kiem_hoc_sinh(maHS = None, hoTen = None, maLop = None, gioiTinh
= None):

```

```
{

```

```
// Start with the full list of students
```

```
danh_sach_hoc_sinh_tim_thay = danh_sach_hoc_sinh
```

```
// Filter by student ID if provided
```

```
if maHS is not None:
```

```

danh_sach_hoc_sinh_tim_thay = filter(danh_sach_hoc_sinh_tim_thay,
hs => maHS in hs.MaHS)

```

```
// Filter by full name if provided
```

```

if hoTen is not None:
    danh_sach_hoc_sinh_tim_thay = filter(danh_sach_hoc_sinh_tim_thay,
                                           hs => hoTen in hs.HoHS or hoTen in hs.TenHS)

// Filter by class ID if selected

if maLop is not None:
    danh_sach_hoc_sinh_tim_thay = filter(danh_sach_hoc_sinh_tim_thay,
                                           hs => hs.MaLop == maLop)

// Filter by gender if selected

if gioiTinh is not None:
    danh_sach_hoc_sinh_tim_thay = filter(danh_sach_hoc_sinh_tim_thay,
                                           hs => hs.GioiTinh == gioiTinh)

// Return the filtered list of students

return danh_sach_hoc_sinh_tim_thay
}

// filter(...): filters the list based on the provided condition (search by name, gender,
// class)

```

### **3.3.3.8 Student Attendance Function**

```

Function AttendanceByClass(ds_DiemDanh, MaLop, NgayDiemDanh)

{
    if (ds_DiemDanh is empty) {

        // Return the "AttendanceByClass" view to generate a new list with MaLop and
        // NgayDiemDanh

        return View("AttendanceByClass", CreateNewList(MaLop, NgayDiemDanh));

    }

    // Iterate through ds_DiemDanh

    foreach (hoc_sinh in ds_DiemDanh)

```

```

{

// Check if MaHS exists in the database

if (MaHS does not exist) continue;

// Find attendance record dl_diemdanh for the student

dl_diemdanh = FindAttendance(hoc_sinh.MaHS, NgayDiemDanh);

if (dl_diemdanh is null)

{

// Add a new attendance record with the following information

CreateNewAttendance( {

    MaHS = hoc_sinh.MaHS,
    NgayDiemDanh = NgayDiemDanh,
    TrangThai = hoc_sinh.TrangThai,
    GhiChu = hoc_sinh.GhiChu

});}

else

{

    Update attendance status and note

    dl_diemdanh.TrangThai = hoc_sinh.TrangThai;
    dl_diemdanh.GhiChu = hoc_sinh.GhiChu;
    MarkAsModified(dl_diemdanh);

}

}

// Save changes to the database

SaveChanges();

```

Return the view with the result

}

### ***3.3.3.9 Add Teaching Program Function***

```
Function CreateCTH(Thong_tin_CTH) {  
    if (Thong_tin_CTH) {  
        //Add and save Thong_tin_CTH  
        SaveToDatabase(Thong_tin_CTH);  
        // Return the "DsChuongTrinhHoc" view with the newly added information  
        return View("DsChuongTrinhHoc", Thong_tin_CTH);  
    }  
    // Return the default display view  
    return View();  
}
```

### ***3.3.3.10 Extracurricular Activities Lookup Function***

```
Function DsHoatDongHT(keyword) {  
    // Search based on keyword matching TenHD (Activity Name) or TenDiaDiem  
    // (Location Name)  
    if (keyword is not null) {
```

// Retrieve activity information by keyword

hoatDong = keyword similar to TenHD OR keyword similar to TenDiaDiem;

}

Sort the activities by ThoiGianToChuc (Event Time) in descending order (most recent first)

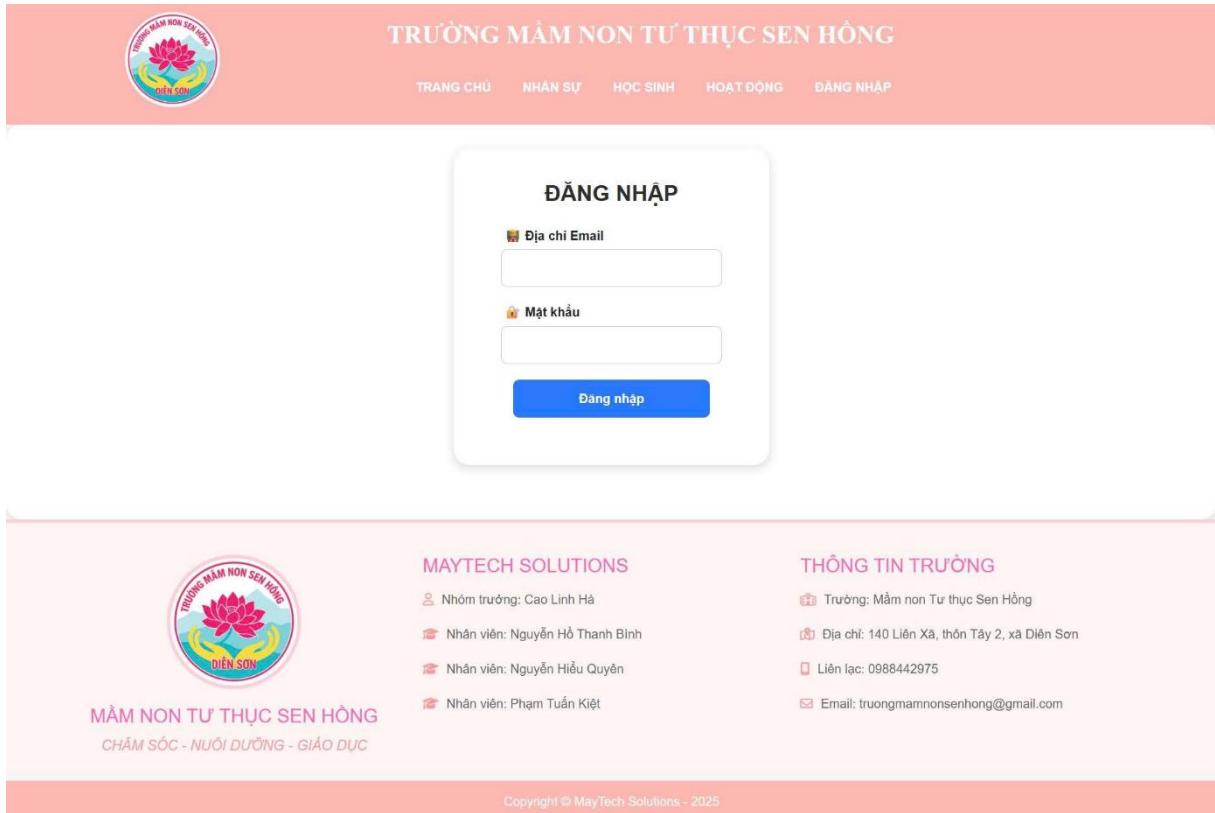
hoatDong = hoatDong.OrderByDescending(hd => hd.ThoiGianToChuc);

Return the view with the search results

}

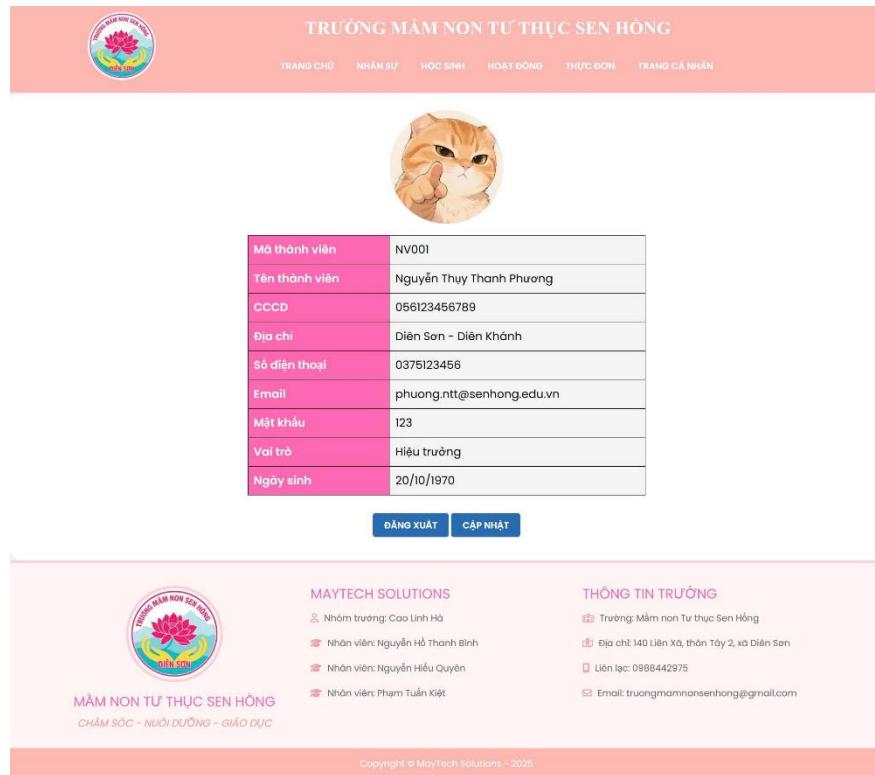
## 3.2 Demo Product

### 3.2.1 Login Interface



**Figure 3.3. User Login Interface**

The login interface is designed to serve both school staff and parents of students. Each user who logs in will be authenticated according to their individual role and directed to the interface appropriate to their function and authority. This ensures that each user group has a separate, efficient and secure experience while using the system.



**Figure 3.4. User Profile Interface**

### 3.2.2 Human Resources Interface

#### 3.2.2.1 Personnel List Interface

The Personnel List interface displays all information about the staff, teachers and employees in the school. Depending on the user's role, the system will adjust the scope of information displayed to ensure confidentiality and reasonable authorization. Specifically, accounts with high management roles such as Principal or Vice Principal will be allowed to view full details of each staff member, including personal information, professional qualifications, work history, etc. In contrast, users with lower roles will only see basic information, suitable for their functions and tasks in the system.

STT	Mã nhân viên	Họ tên nhân viên	Giới tính	Email	SĐT	Chức vụ	Chức năng
1	NV008	Ngô Kim Thanh	Nữ	thanh.kt@senhong.edu.vn	0385544662	Giáo viên	
2	NV011	Trần Mạnh Dũng	Nam	dung.tm@senhong.edu.vn	0392233445	Giáo viên	
3	NV003	Trần Minh Khang	Nam	khang.tm@senhong.edu.vn	0386543210	Kế toán	
4	NV002	Lương Ngọc Diễm Chi	Nữ	chi.lnd@senhong.edu.vn	0386543210	Hiệu phó	
5	NV012	Lê Nhật Quân	Nam	quan.ln@senhong.edu.vn	0392233445	Giáo viên	

1 | 2 | 3 | 4 | 5

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**Figure 3.5. Staff List interface for Principal and Vice Principal roles**

Principals and Vice Principals can view detailed personnel information and operations through the Function column (view detailed information, update, edit, delete) and Add staff.

**CẬP NHẬT THÔNG TIN NHÂN VIÊN**

Mã nhân viên	NV008
Họ nhân viên	Ngô
Tên nhân viên	Kim Thanh
Giới tính	<input type="radio"/> Nam <input checked="" type="radio"/> Nữ
Ngày sinh	09/09/1997 12:00:00 AM
CCCD	056556677889
Địa chỉ	Tân Lập - Nha Trang
Email	thanh.kt@senhong.edu.vn
Mật khẩu	123
Số điện thoại	0385544662
Chức vụ	Giáo viên

**Lưu**

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**Figure 3.6. Employee Information Update Interface**

**THÔNG TIN CHI TIẾT CỦA NHÂN VIÊN**

Mã nhân viên	NV008
Họ nhân viên	Ngô
Tên nhân viên	Kim Thanh
Giới tính	Nữ
Ngày sinh	09/09/1997
CCCD	056556677889
Địa chỉ	Tân Lập - Nha Trang
Email	thanh.kt@senhong.edu.vn
Mật khẩu	123
Số điện thoại	0385544662
Chức vụ	Giáo viên

**CẬP NHẬT** **QUAY LẠI**

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**Figure 3.7. Interface View detailed employee information**

THÔNG TIN CHI TIẾT CỦA NHÂN VIÊN	
Mã nhân viên viên	NV008
Họ nhân viên	Ngõ
Tên nhân viên	Kim Thanh
Giới tính	Nữ
Ngày sinh	09/09/1997
CCCD	056556677889
Địa chỉ	Tân Lập - Nha Trang
Email	thanh.kt@senhong.edu.vn
Mật khẩu	123
Số điện thoại	0385544662
Chức vụ	Giáo viên

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**Figure 3.8. Delete Employee Information Interface**

When adding a new employee, the system will automatically generate an employee code to ensure uniqueness and avoid duplication. In addition to basic information such as full name, gender, date of birth, etc., professional qualifications are a particularly important factor.

The system requires that the employee's qualifications match the assigned role. Specifically, each role in the system will require a corresponding minimum qualification. If the selected qualification does not meet the role's requirements, the system will display a warning and will not allow additional employees until valid information is provided.

Figure 3.9. Add Employee Interface

Figure 3.10. Employee List interface of other roles

Unlike the Principal and Vice Principal, other staff in the school can only see basic staff information such as full name, email, etc.

### 3.2.2.2 Personnel Information Lookup Interface

The screenshot displays the personnel information lookup interface for the "Trường Mầm Non Tự Thực Sen Hồng". The interface is designed with a pink header and footer, and a white main content area.

**Header:**

- Logo: Trường Mầm Non Sen Hồng
- Title: TRƯỜNG MẦM NON TỰ THỰC SEN HỒNG
- Navigation menu: TRANG CHỦ, NHÂN SỰ, HỌC SINH, HOẠT ĐỘNG, THỰC ĐƠN, TRANG CÁ NHÂN

**Main Content Area:**

**Search Form:**

- Tên thành viên: Khang
- Giới tính:  Nam  Nữ
- Vai trò: -- Tất cả --
- Buttons: TÌM KIẾM, ĐẶT LẠI, THÊM THÀNH VIÊN

**Results Table:**

STT	Mã nhân viên	Họ tên nhân viên	Giới tính	Email	SĐT	Chức vụ	Chức năng
1	NV003	Trần Minh Khang	Nam	khang.tm@senhong.edu.vn	0386543210	Kế toán	

**Footer:**

- Logo: Trường Mầm Non Sen Hồng
- MAMB NON TU THUC SEN HONG
- CHĂM SÓC - NUÔI DƯỠNG - GIÁO DỤC
- MAYTECH SOLUTIONS
- Thông tin trường:
  - Trưởng: Mầm non Tự thực Sen Hồng
  - Địa chỉ: 140 Liên Xã, thôn Tây 2, xã Diên Sơn
  - Liên lạc: 0988442975
  - Email: truongmamnonsenhong@gmail.com
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**Figure 3.11. Personnel Information Lookup Interface**

The Personnel Information Lookup interface allows users to quickly search for personnel in the school through criteria such as last name, first name, gender or role. When users enter information into the search fields, the system will automatically filter and display a list of employees that match the request, helping to save time and improve the efficiency of personnel management.

### 3.2.2.3 Timekeeping Interface

**TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG**

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG CHẨM CÔNG HỌC PHÍ TRANG CÁ NHÂN

**CHẨM CÔNG NHÂN VIÊN**

Chức vụ: Cấp dưỡng  
Ngày chấm công: 06/03/2025

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**Figure 3.12. Timekeeping Interface for Accountants**

The timekeeping interface allows Accountants to perform timekeeping for employees in specific roles on a specified date. The timekeeping is applied simultaneously to all employees in the selected role at the specified time.

**TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG**

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG CHẨM CÔNG HỌC PHÍ TRANG CÁ NHÂN

**Chấm công cho Cấp dưỡng ngày 03/06/2025**

Mã nhân viên	Họ nhân viên	Tên nhân viên	Đi làm	Ghi chú
NV013	Nguyễn	Thúy Phương	<input checked="" type="checkbox"/>	Nhập ghi chú...
NV014	Phan	Thị Kim Dung	<input checked="" type="checkbox"/>	Nhập ghi chú...
NV015	Nguyễn	Văn Hoa	<input type="checkbox"/>	Bệnh sốt

**MAYTECH SOLUTIONS**

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- Nhân viên: Nguyễn Hồ Thanh Bình
- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

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**Figure 3.13. Timekeeping interface by position and date**

After selecting the position and the date of attendance, click on the “Attendance” button, the system will automatically display a list of all employees currently in that role. Here, the Accountant can check the list, mark the “working” status for each employee through the checkbox, and can also add notes on the reason for absence, leave or related information if necessary.

When finished, the user clicks the “Save attendance” button so that the system can record all data into the database accurately and securely. If the attendance data for that day and employee already exists, the system will update it; if not, the system will automatically create a new record. At the same time, a attendance viewing interface appears for the Accountant to confirm whether the attendance information has been entered correctly.

Tổng quan chấm công				
Tổng NV	Có mặt	Vắng mặt	Tỷ lệ có mặt	
3	2	1	66.7%	
Tổng NV	Có mặt	Vắng mặt	Tỷ lệ có mặt	
NV013	Nguyễn	Thúy Phượng	<input checked="" type="checkbox"/> Có mặt	-
NV014	Phan	Thị Kim Dung	<input checked="" type="checkbox"/> Có mặt	-
NV015	Nguyễn	Văn Hoa	<input checked="" type="checkbox"/> Vắng mặt	Bệnh sốt

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- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

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**Figure 3.14. Interface View detailed information of recently clocked in**

When it is necessary to make a timekeeping report or handle requests related to monitoring the work status of employees, the accountant will use the “View timekeeping” function. After clicking this button, an intuitive statistical interface will appear, allowing the accountant to select a specific position and the time period for which statistics are needed - from the start date to the end date.

Immediately after selecting the criteria, the system will display the corresponding timekeeping report, including detailed information of each employee such as employee code, full name, number of days present, number of days absent and attendance rate during the selected period.

**TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG**

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG CHẤM CÔNG HỌC PHÍ TRANG CÁ NHÂN

**BÁO CÁO CHẤM CÔNG**

Chức vụ: Cấp dưỡng Từ ngày: 06/03/2025 Đến ngày: 06/04/2025 Xem báo cáo ← Quay lại

**Cấp dưỡng**  
Khoảng thời gian: 6/3/2025 - 6/4/2025

Mã NV	Họ tên	Số ngày có mặt	Số ngày vắng	Tỷ lệ có mặt
NV013	Nguyễn Thúy Phượng	1 ngày	0 ngày	100.0%
NV014	Phan Thị Kim Dung	1 ngày	0 ngày	100.0%
NV015	Nguyễn Văn Hoa	0 ngày	1 ngày	0.0%

**MAYTECH SOLUTIONS**

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- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

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**Figure 3.15. Timekeeping Statistics Interface by Position**

### 3.2.3 Student related interface

#### 3.2.3.1 Student List Interface

The screenshot displays the 'DANH SÁCH HỌC SINH' (Student List) page. At the top, there's a navigation bar with links: TRANG CHỦ, NHÂN SỰ, HỌC SINH, HOẠT ĐỘNG, THỰC ĐƠN, and TRANG CÁ NHÂN. Below the navigation is a search bar with placeholder text 'Tìm kiếm tên học sinh...'. There are also buttons for 'Giới tính' (Gender), 'Chọn lớp' (Select Class), and three action buttons: 'Tìm kiếm' (Search), 'Đặt lại' (Reset), and 'Thêm học sinh' (Add Student). The main content area shows a table of student records:

SỐ TÍCH	MÃ HỌC SINH	HỌ TÊN HỌC SINH	GENDER	ĐỊA CHỈ	LỚP	NGÀY NHẬP HỌC	CHỨC NĂNG
1	HS003	Nguyễn Duy Khang	Nam	Thôn Diên Sơn, Diên Khánh, Khánh Hòa	Lớp 25-36 tháng	09/05/2023	
2	HS001	Bùi Gia Bách	Nam	45 Lý Thánh Tôn, Nha Trang, Khánh Hòa	Lớp 25-36 tháng	05/09/2023	
3	HS009	Đào Gia Vy	Nam	Thôn Diên Điền, Diên Khánh, Khánh Hòa	Lớp 3-4 tuổi	05/09/2023	
4	HS005	Trần Hải Đăng	Nam	Thôn Diên Phước, Diên Khánh, Khánh Hòa	Lớp 25-36 tháng	05/09/2023	
5	HS004	Tăng Hoàng Bảo Nhi	Nữ	Thôn Diên Điền, Diên Khánh, Khánh Hòa	Lớp 25-36 tháng	05/09/2023	

Below the table are small navigation arrows for pagination. The footer contains the school logo, name 'MAM NON TU THUC SEN HONG', and motto 'CHAM SOC - NUOI DUONG - GIAO DUC'. It also lists 'MAYTECH SOLUTIONS' staff members and 'THONG TIN TRUONG' (School Information) details like address, phone number, and email.

Figure 3.16 Student List Interface

The student page interface displays student search criteria, the add student button and the student list: including student information and functions for editing, viewing details and deleting students.

- Perform the student search function: Click the Search button.
- Perform the function of returning to the student list after searching: Click the Reset button.
- Perform the function of adding new students: Click the Add student button.

TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG THỰC ĐƠN TRANG CA NHÂN

**Thêm mới học sinh**

Mã học sinh: H0024

Nghỉ nhập học: 06/07/2025

Ngày sinh: 06/07/2022

Lứa tuổi: Lớp 3-4 tuổi

Họ và tên: Nguyễn

Tên: Gia Khang

Giới tính: ♂ Nam

Địa chỉ: Khuôn Hòa

**Thêm học sinh**

Quay lại danh sách

Ngày nhập học: 06/07/2025

Ngày sinh: 06/07/2022

Tuổi tính đến ngày nhập học: 3 tuổi 0 tháng.

Lớp: Lớp 5-6 tuổi

Lớp học được chọn không phù hợp với độ tuổi. Vui lòng chọn lại.

Ngày nhập học: 06/07/2025

Ngày sinh: 06/07/2025

Tuổi tính đến ngày nhập học: 0 tuổi (chỉ nhận từ 2 tuổi trở lên).

MAYTECH SOLUTIONS

- Nhóm trưởng: Cao Linh Hà
- Nhân viên: Nguyễn Hồ Thành Bình
- Nhân viên: Nguyễn Hữu Quyết
- Nhân viên: Phạm Tuấn Kiệt

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- Liên lạc: 0988442979
- Email: truongmamnonsenhong@gmail.com

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**Figure 3.17. Add new student interface**

- Principals and vice principals add students by clicking the Add Student button on the student page interface.
- Enter the student's complete information, then click the Add button.
- If the age does not match the corresponding class, an error message will be displayed.

TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG THỰC ĐƠN TRANG CA NHÂN

**Cập nhật thông tin học sinh**

Họ học sinh: Nguyễn

Tên học sinh: Duy Khang

Giới tính: ♂ Nam

Lớp học: Lớp 25-36 tháng

Ngày nhập học: 5/9/2023 12:00:00 AM

Địa chỉ: thôn Diên Sơn, Diên Khánh, Khánh

Lưu thay đổi

Quay lại

MAYTECH SOLUTIONS

- Nhóm trưởng: Cao Linh Hà
- Nhân viên: Nguyễn Hồ Thành Bình
- Nhân viên: Nguyễn Hữu Quyết
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**Figure 3.18. Student Information Update Interface**

- Principals and vice principals update student information by clicking the edit icon in the function column of the student page interface to perform the update function.
- Update the necessary information, then click the Save Changes button.
- Click the Back button to return to the student list page.

The screenshot shows the 'Thông tin chi tiết học sinh' (Student Details) page for a student named Nguyễn Duy Khang. At the top, there's a header with the school logo and the name 'TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG'. Below the header, the student's name is displayed in bold. A note indicates he is in 'Lớp Lớp 25-36 tháng'. The main content area is divided into several sections: 
 

- Giới tính:** Nam / **Ngày nhập học:** 5/9/2023 12:00:00 AM
- Địa chỉ:** thôn Diên Sơn, Diên Khánh, Khánh Hòa
- Thông tin phụ huynh:** Lê Thị Mai (Mother)
- Sức khỏe gần nhất:** Cân nặng: 13.80 kg, Chiều cao: 95.00 cm, Ghi chú: Thủ cấp cần nhẹ, Kiem tra: MM/yyyy
- Trình hình học tập:** Danh giá: Năm bài chắc, Xếp loại: C, Ghi chú: Biết áp dụng kiến thức tốt, Danh giá: 24/05/2025

 At the bottom of this section are two buttons: 'Cập nhật' (Update) and 'Trở về' (Back). 
 The footer of the page includes the school logo, the name 'MẦM NON TƯ THỰC SEN HỒNG', the motto 'CHĂM SÓC - NUÔI DƯỠNG - GIÁO DỤC', and contact information for 'MAYTECH SOLUTIONS' and 'THÔNG TIN TRƯỜNG'.

**Figure 3.19. Student Details Interface**

- Principals and vice principals view student information by clicking the view details icon in the function column of the student page interface to perform the update function.
- Full student information will be displayed on the screen.
- Teachers can only view student details when logged in, only view but are not allowed to add, edit and delete.

### 3.2.3.2 Student Information Lookup Interface

The screenshot shows a web application interface for searching student information. At the top, there is a navigation bar with the school logo and links for 'TRANG CHỦ', 'NHÂN SỰ', 'HỌC SINH', 'HOẠT ĐỘNG', 'THỰC ĐƠN', and 'TRANG CÁ NHÂN'. Below the navigation bar, the title 'DANH SÁCH HỌC SINH' is displayed. A search form allows users to enter 'Tên thành viên' (Khang), 'Giới tính' (Nam selected), 'Chọn lớp' (Lớp 25-36 tháng), and search buttons for 'Tìm kiếm', 'Đặt lại', and 'Thêm học sinh'. A table below the search form lists one student: STT 1, MÃ học sinh HS003, Họ tên học sinh Nguyễn Duy Khang, Giới tính Nam, Địa chỉ thôn Diên Sơn, xã Diên Khanh, huyện Diên Phuk, Lớp Lớp 25-36 tháng, Ngày nhập học 09/05/2023, and Chức năng (with icons for edit, delete, and details). At the bottom of the page, there is a footer with the school's logo, name, and values: 'MAM NON TU THUC SEN HONG', 'CHAM SOC - NUOI DUONG - GIAO DUC', and copyright information: 'Copyright © MayTech Solutions - 2025'.

**Figure 3.20. Student Information Lookup Interface**

When you want to search: Select criteria such as Member Name or Gender or Select Class to search. If you want to search precisely, search all criteria at the same time.

When you have selected the criteria, click the Search button, the system will filter out the results corresponding to the selected criteria.

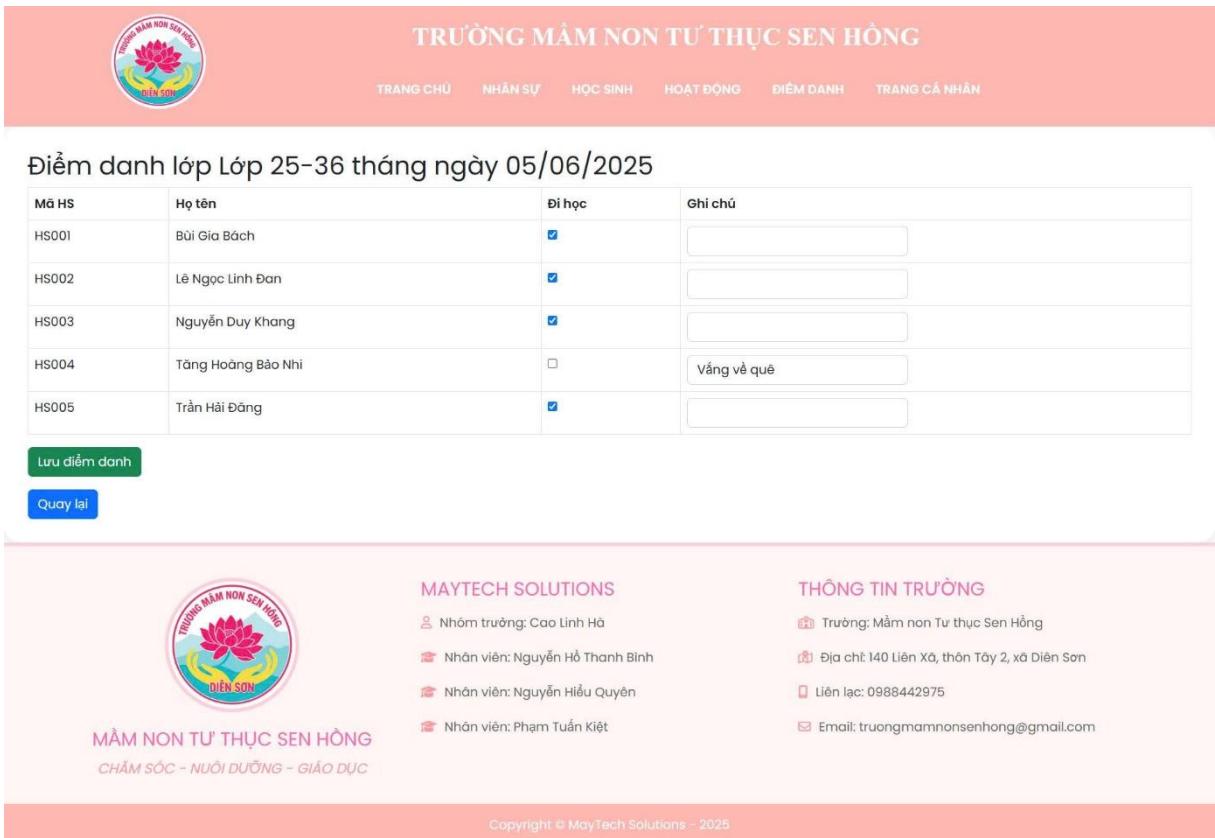
When you want to return to the list of all students, select the Reset button.

### 3.2.3.3 Attendance Interface

The screenshot shows a web application interface for managing student attendance. At the top, there is a navigation bar with the school logo and links for 'TRANG CHỦ', 'NHÂN SỰ', 'HỌC SINH', 'HOẠT ĐỘNG', 'ĐIỂM DANH', and 'TRANG CÁ NHÂN'. Below the navigation bar, the title 'Điểm Danh Học Sinh' is displayed. A search form allows users to enter 'LỚP HỌC' (Lớp 25-36 tháng selected) and 'NGÀY ĐIỂM DANH' (06/05/2025), and buttons for 'ĐIỂM DANH' and 'XEM ĐIỂM DANH'. A table below the search form lists one student: MAYTECH SOLUTIONS (Nhóm trưởng: Cao Linh Hà, Nhân viên: Nguyễn Hồ Thành Bình, Nhân viên: Nguyễn Hiếu Quyền, Nhân viên: Phạm Tuấn Kiệt) and THÔNG TIN TRƯỜNG (Trường: Mầm non Tư thực Sen Hồng, Địa chỉ: 140 Liên Xã, thôn Tây 2, xã Diên Sơn, Liên lạc: 0988442975, Email: truongmamnonsenhong@gmail.com). At the bottom of the page, there is a footer with the school's logo, name, and values: 'MAM NON TU THUC SEN HONG', 'CHAM SOC - NUOI DUONG - GIAO DUC', and copyright information: 'Copyright © MayTech Solutions - 2025'.

**Figure 3.21. Attendance interface**

- The teacher selects the class and the day to take attendance, then clicks the attendance button to display the list of that class.
- Click View attendance to see the attendance results by class and day.
- The future and weekend attendance dates cannot be selected, the teacher can only perform the attendance function within 30 days from the current day.
- If the teacher clicks attendance without selecting a Class, an error message will appear.



The screenshot shows the attendance interface for 'TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG'. At the top, there's a logo and a navigation bar with links: TRANG CHỦ, NHÂN SỰ, HỌC SINH, HOẠT ĐỘNG, ĐIỂM DANH, and TRANG CÁ NHÂN. Below the navigation is a title: 'Điểm danh lớp Lớp 25-36 tháng ngày 05/06/2025'. A table lists student attendance:

Mã HS	Họ tên	Đi học	Ghi chú
HS001	Bùi Gia Bách	<input checked="" type="checkbox"/>	
HS002	Lê Ngọc Linh Đan	<input checked="" type="checkbox"/>	
HS003	Nguyễn Duy Khang	<input checked="" type="checkbox"/>	
HS004	Tăng Hoàng Bảo Nhi	<input type="checkbox"/>	Vắng về quê
HS005	Trần Hải Đăng	<input checked="" type="checkbox"/>	

At the bottom are two buttons: 'Lưu điểm danh' (Save attendance) and 'Quay lại' (Back).

Below the main content is a footer with the school's logo, name, and contact information:

**MÂM NON TƯ THỰC SEN HỒNG**  
CHẤM SÓC - NUÔI DƯỠNG - GIÁO DỤC

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- Nhân viên: Nguyễn Hiếu Quyên
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**Figure 3.22 Attendance list interface**

- Teachers tick the Attending class box to check the attendance of students, can add notes, then click Save Attendance.
- Click the Back button to return to the Attendance page.

Lưu điểm danh thành công!

Kết quả điểm danh lớp Lớp 25-36 tháng - 05/06/2025

MÃ HS	Họ tên	Trạng thái	Ghi chú
HS001	Bùi Gia Bách	Có	
HS002	Lê Ngọc Linh Đan	Có	
HS003	Nguyễn Duy Khang	Có	
HS004	Tống Hoàng Bảo Nhi	Vắng	Vắng về quê
HS005	Trần Hải Đăng	Có	

[Quay lại](#)

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- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

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**Figure 3.23. Attendance results page interface**

- After clicking Save Attendance, it will go to the attendance result page and display the message Attendance Successful.
- Click the back button to return to the attendance list.

TRƯỜNG MÃM NON TƯ THỰC SEN HỒNG

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG ĐIỂM DANH TRANG CÁ NHÂN

Thống Kê Điểm Danh

CHỌN LỚP  
-- Chọn lớp học --

CHỌN NGÀY  
06/05/2025

XEM KẾT QUẢ

← QUAY LẠI

MÃM NON TƯ THỰC SEN HỒNG  
CHÂM SÓC - NUÔI DƯỠNG - GIÁO DỤC

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- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

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**Figure 3.24. Attendance statistics interface**

- Teachers select class and roll call date to view roll call results.
- Click back to return to roll call statistics page.

### 3.3.3 Extracurricular Activities Interface

The screenshot shows a web-based application for managing extracurricular activities. At the top, there's a navigation bar with the school's name 'TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG' and links for TRANG CHỦ, NHÂN SỰ, HỌC SINH, HOẠT ĐỘNG, THÔNG BÁO, and TRẠNG CÀ NHÂN. Below the navigation is a form titled 'TẠO HOẠT ĐỘNG NGOẠI KHÓA' (Create Extracurricular Activity). The form fields include:

- Tên hoạt động (Activity Name): Vẽ tranh thiên nhiên, Mù...
- Mô tả hoạt động (Description): Mô tả chi tiết về hoạt động, mục đích, cách thức tổ chức...
- Thời gian tổ chức (Date): mm/dd/yyyy - - - -
- Địa điểm tổ chức (Location): Ví dụ: Sân chơi trường, Phòng...
- Giáo viên phụ trách (Teacher-in-charge): Nhập mã giáo viên phụ trách

At the bottom of the form are two buttons: 'Tạo hoạt động' (Create Activity) and 'Quay lại danh sách' (Return to List).

The footer of the page includes the school's logo, name 'MẦM NON TƯ THỰC SEN HỒNG CHĂM SÓC – NUÔI DƯỠNG – GIÁO DỤC', and contact information for MAYTECH SOLUTIONS and the school. It also features a copyright notice: 'Copyright © MayTech Solutions - 2025'.

**Figure 3.25 Interface to add extracurricular activities**

- Principals, vice principals and teachers have the right to add extracurricular activities by clicking the button to create a new activity for the child on the activity page interface.
- Enter full information of the activity, then click the add button.

TRƯỜNG MẦM NON TỰ THỰC SEN HỒNG

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG THỰC ĐƠN TRANG CÁ NHÂN

Chỉnh sửa hoạt động ngoại khóa

Tên hoạt động: Tham quan thư viện

Mô tả hoạt động: Các bé được nghe kể chuyện và xem sách tranh

Thời gian tổ chức: 5/5/2025 12:00:00 AM

Địa điểm tổ chức: Thư viện thiếu nhi Điện Khanh

Nhân viên phụ trách: Chọn nhân viên

Lưu thay đổi

Quay lại danh sách

MAYTECH SOLUTIONS

Trưởng: Cao Linh Hà  
Nhân viên: Nguyễn Hồ Thành Bình  
Nhân viên: Nguyễn Hiếu Quyền  
Nhân viên: Phạm Tuấn Kiệt

THÔNG TIN TRƯỜNG

Trường: Mầm non Tự thực Sen Hồng  
Địa chỉ: 140 Liên Xã, thôn Tây 2, xã Điện Sơn  
Liên lạc: 0988442975  
Email: truongmamnonsenhong@gmail.com

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**Figure 3.26. Activity editing interface**

- Principals, vice principals and teachers have the right to edit extracurricular information by clicking the edit icon in the function column of the activity page interface to perform the edit function.
- Edit the necessary activity information, then click the Save Changes button.

TRƯỜNG MẦM NON TỰ THỰC SEN HỒNG

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG THỰC ĐƠN TRANG CÁ NHÂN

Chi tiết hoạt động ngoại khóa

Hoạt động ngoại khóa: Tham quan thư viện  
Mô tả hoạt động: Các bé được nghe kể chuyện và xem sách tranh  
Thời gian tổ chức: 5/5/2025 12:00:00 AM  
Địa điểm tổ chức: Thư viện thiếu nhi Điện Khanh  
Nhân viên phụ trách: Phạm Phúc Nam

Chỉnh sửa Quay lại

MAYTECH SOLUTIONS

Trưởng: Cao Linh Hà  
Nhân viên: Nguyễn Hồ Thành Bình  
Nhân viên: Nguyễn Hiếu Quyền  
Nhân viên: Phạm Tuấn Kiệt

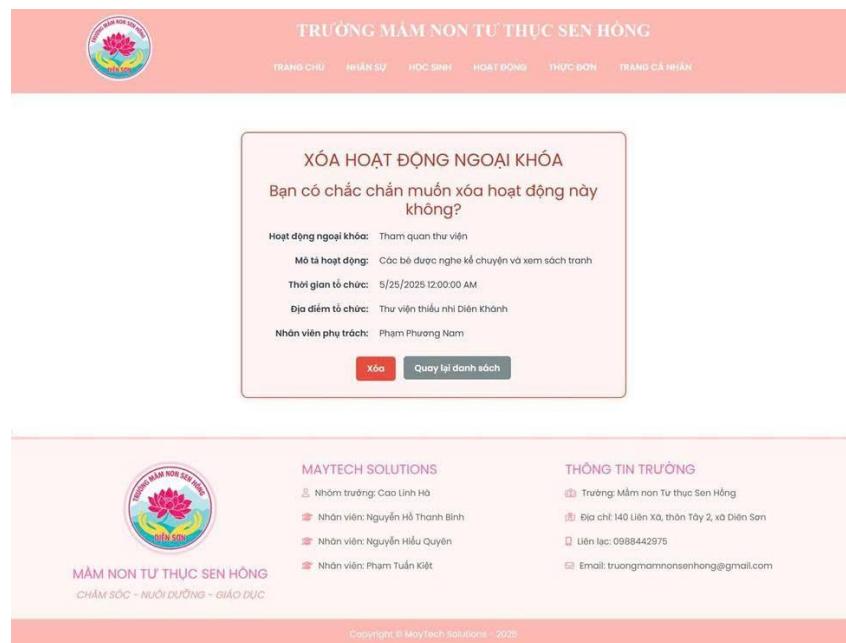
THÔNG TIN TRƯỜNG

Trường: Mầm non Tự thực Sen Hồng  
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**Figure 3.27. Interface to view extracurricular activities details**

- Principals, vice principals and teachers can view activity information by clicking the view details icon in the function column of the activity page interface to perform the update function.
- Parents can only view student details when logged in, only view but are not allowed to add, edit and delete.



**Figure 3.28. Delete extracurricular activities interface**

- Principals, vice principals and teachers have the right to delete activities by clicking the delete icon in the function column of the activity page interface to perform the delete function.

**TRƯỜNG MẦM NON TƯ THỰC SEN HỒNG**

TRANG CHỦ NHÂN SỰ HỌC SINH HOẠT ĐỘNG TRANG CÁ NHÂN

thể thao

Tìm kiếm Đặt lại Hoạt động mới

**Ngày hội thể thao**

3/15/2025 12:00:00 AM Địa điểm: Sân vận động thiếu nhi ở nhà văn hóa thôn

Giáo viên phụ trách: Lương Ngọc Diễm Chi

Tổ chức trò chơi vận động ngoài trời

Chỉnh sửa Xem chi tiết Xóa

MAYTECH SOLUTIONS

- Nhóm trưởng: Cao Linh Hà
- Nhân viên: Nguyễn Hồ Thanh Bình
- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

THÔNG TIN TRƯỜNG

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**Figure 3.29. Extracurricular Activities Lookup Interface**

- Employees can search for extracurricular activities according to many criteria: activity name and location name
- Then click the Search button to get results corresponding to the selected criteria.
- Employees click the Reset button to return to the original list of all extracurricular activities.

### 3.3.4 Curriculum Interface

**DANH SÁCH CHƯƠNG TRÌNH HỌC**

Mã CT	Tên chủ đề	Độ tuổi	Nội dung	Thao tác
CT001	Làm quen trường lớp	1 - 2 tuổi	Giúp trẻ làm quen với môi trường mầm non, cô giáo và bạn bè	Xem   Sửa   Xoá
CT002	Bản thân	2 - 4 tuổi	Nhận biết các bộ phận cơ thể, chăm sóc bản thân và vệ sinh cá nhân	Xem   Sửa   Xoá
CT003	Gia đình	2 - 6 tuổi	Trẻ hiểu về các thành viên trong gia đình và tình cảm gia đình	Xem   Sửa   Xoá
CT004	Thế giới động vật	3 - 6 tuổi	Làm quen với các con vật nuôi, động vật hoang dã, tiếng kêu và nơi sống của chúng	Xem   Sửa   Xoá
CT005	Các phương tiện giao thông	3 - 10 tuổi	Nhận biết các loại xe, luật lệ an toàn giao thông cơ bản	Xem   Sửa   Xoá
CT006	Thiên nhiên quanh bé	3 - 6 tuổi	Tìm hiểu về cây cối, thời tiết, bốn mùa, hiện tượng tự nhiên	Xem   Sửa   Xoá
CT007	Bé vui học chữ cái	4 - 6 tuổi	Làm quen chữ cái qua trò chơi, hình ảnh, âm thanh	Xem   Sửa   Xoá
CT008	Khám phá toán học	4 - 6 tuổi	Nhận biết số lượng, hình dạng, màu sắc, kích thước, so sánh	Xem   Sửa   Xoá
CT009	Giáo dục kỹ năng sống	3 - 6 tuổi	Học kỹ năng tự lập, làm việc nhóm, chia sẻ, ứng xử lễ phép	Xem   Sửa   Xoá
CT010	Ngày lễ và truyền thống	3 - 6 tuổi	Tìm hiểu về Tết Nguyên Đán, Trung Thu, ngày Nhà giáo Việt Nam...	Xem   Sửa   Xoá
CT11	Lập trình	5 - 6 tuổi	Lập trình cơ bản	Xem   Sửa   Xoá

**MAYTECH SOLUTIONS**

- Trưởng: Cao Linh Hà
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- Nhân viên: Nguyễn Hữu Quyền
- Nhân viên: Phạm Tuấn Kiệt

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**Figure 3.30. Vice Principal Role Curriculum List Interface**

The Sen Hong Kindergarten Curriculum List interface displays a table of curriculums by topic, age and content.



### THÊM CHƯƠNG TRÌNH HỌC

Mã chương trình

VĐ: CT01

Tên chủ đề

VĐ: Chủ đề Thế giới động vật

Nội dung chương trình

Mô tả các hoạt động và nội dung  
học tập...

Độ tuổi bắt đầu

Độ tuổi kết thúc

Lưu chương trình

← Quay lại danh sách



**Figure 3.31. Add Course Interface**

- The Vice Principal has the right to add a curriculum by clicking the add curriculum button on the subject interface page.
- Enter the full information of the curriculum and then click the add button. In case the data fields are not entered enough, the program will not be added.

<b>Mã chương trình</b>	CT001
<b>Tên chủ đề</b>	Làm quen trường lớp
<b>Nội dung</b>	Giúp trẻ làm quen với môi trường mầm non, cô giáo và bạn bè
<b>Độ tuổi bắt đầu</b>	1 tuổi
<b>Độ tuổi kết thúc</b>	2 tuổi

**MAYTECH SOLUTIONS**

- Nhóm trưởng: Cao Linh Hà
- Nhân viên: Nguyễn Hồ Thanh Bình
- Nhân viên: Nguyễn Hiếu Quyên
- Nhân viên: Phạm Tuấn Kiệt

**THÔNG TIN TRƯỜNG**

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- Liên lạc: 0988442975
- Email: truongmamnonsenhong@gmail.com

**Figure 3.32. Interface View detailed information about the study program**

Teachers can view curriculum information by clicking the view details icon in the function column of the curriculum page interface to plan lessons according to the topics given by the vice principal.

The screenshot shows the 'CẬP NHẬT CHƯƠNG TRÌNH HỌC' (Curriculum Update) page. It includes fields for 'Tên chủ đề' (Subject Name), 'Nội dung chương trình' (Program Content), 'Độ tuổi bắt đầu' (Age Start), and 'Độ tuổi kết thúc' (Age End). A red 'Cập nhật chương trình' (Update Program) button is at the bottom.



**Figure 3.33. Curriculum Update Interface**

- The Vice Principal has the right to update the curriculum information by clicking the edit icon in the function column of the curriculum page interface to perform the edit function.
- Update the necessary curriculum information, then click the update program button.

The screenshot shows the top navigation bar of the website. It features a circular logo on the left with the text "TRƯỜNG MẦM NON SEN HỒNG" and "DIỄN SƠN". To the right of the logo is the school name "TRƯỜNG MẦM NON TU THỰC SEN HỒNG". Below the logo are six menu items: TRANG CHỦ, NHÂN SỰ, HỌC SINH, HOẠT ĐỘNG, CHỦ ĐỀ, THỰC ĐƠN, and TRANG CÁ NHÂN.

A modal dialog box titled "Bạn có chắc chắn muốn xóa chương trình học này không?" (Do you really want to delete this course program?). Inside the box, there are several details about the course program:

- Mã chương trình: CT11
- Tên chủ đề: Lập trình
- Nội dung: Lập trình cơ bản
- Độ tuổi áp dụng: 5 - 5 tuổi

At the bottom of the dialog box is a red button labeled "Xóa" (Delete) with a trash icon. Below the button is a link "← Quay lại danh sách" (Back to list).

The background of the page shows the school's logo and name "MẦM NON TU THỰC SEN HỒNG CHĂM SÓC - NUÔI DƯỠNG - GIÁO DỤC" at the top, followed by sections for "MAYTECH SOLUTIONS" and "THÔNG TIN TRƯỜNG" with contact information.

**Figure 3.34. Delete Course Interface**

The vice principal has the right to delete activities by clicking the delete icon in the function column of the curriculum page interface to perform the delete function.

## **IV. CONCLUSION**

### **4.1 Results Achieved**

During the implementation of the project " Sen Hong Private Kindergarten Management System ", our team successfully achieved the majority of the initial objectives that were set forth. Specifically, we accomplished the following key goals:

- The website features a user-friendly and intuitive interface, with a visually pleasing and harmonious color scheme that aligns with the branding style of the school. Content is presented in a clear and accessible manner, ensuring a positive user experience through ease of navigation and interaction.
- The website supports role-based access control, allowing different user groups to log into the system using accounts provided by the school. Each role is associated with a customized interface and a distinct set of functionalities, ensuring that users can only access the features relevant to their responsibilities.
- The website successfully performs essential data operations, including create, read, update, and delete (CRUD) functions. These operations are performed efficiently and reliably, allowing users to manage information easily and accurately. In addition, users can search for information easily. The seamless integration of these features contributes to the overall responsiveness and usability of the system.
- The website also integrates timekeeping and workday statistics, allowing schools to effectively track employee hours. This function supports accurate payroll calculations, ensuring fair and transparent salary determination for each employee.
- The website also includes a student attendance tracking feature, enabling teachers to monitor each child's attendance efficiently. This functionality simplifies the process of daily check-ins and supports better supervision and record-keeping for individual students.

### **4.2 Development Direction**

Through the process of researching and developing the “Sen Hong Private Kindergarten Management System” our team has formulated several proposals aimed at enhancing the system with greater diversity and innovation. These suggestions are intended to

further improve the functionality, user experience, and adaptability of the website in future iterations.

- The website can support real-time notifications, allowing important updates such as school activities, news, or tuition fee alerts to be delivered directly to users. This feature enhances communication efficiency between the school and users, ensuring timely access to critical information.
- The system allows parents to pay tuition fees through accounts provided by the school. This feature offers a convenient and secure method for managing payments, streamlining the fee collection process and enhancing financial transparency.
- The system can allow parents to provide feedback and contribute suggestions for improvement. This feature encourages active engagement from parents and supports the continuous enhancement of the platform based on user experience and community input.

### **4.3 Conclusion**

Throughout the development of the “Sen Hong Private Kindergarten Management System” project, our team successfully applied the knowledge acquired in class. We gained a solid understanding of the C# programming language and effectively utilized the MVC design pattern within the .NET framework to implement the application. Additionally, we incorporated knowledge from related subjects, such as database management, to efficiently store and query data using SQL. The team also conducted system analysis to identify the most appropriate development approach. Moreover, we consulted various in-class exercises and online resources to enhance our understanding and ultimately produce the final product.

During the course of this project, our team received valuable support and guidance from Mr. Bùi Chí Thành. Despite this, due to our limited practical experience, our report may still contain certain shortcomings. We sincerely look forward to receiving further feedback and suggestions from Mr. Thành in order to reflect, learn from our mistakes, and improve the quality of our future course projects.

Our team would like to express our sincere gratitude to you, Sir.

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