MAPÚA MALAYAN DIGITAL COLLEGE

A college under Mapúa Malayan Colleges Laguna

MotorPH Payroll System Requirements and Planning Analysis

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Bachelor of Science in Information Technology
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1. Introduction

Payroll processing is a critical business function because it directly affects employee compensation, compliance with statutory deductions, and operational efficiency. MotorPH currently relies on manual or semi-manual payroll processing, which increases the risk of calculation errors, delays in salary release, and inconsistent application of government-mandated deductions. These issues are further amplified when payroll information is spread across multiple files and requires repeated verification.

This project proposes a Java console-based payroll system that reads employee and payroll-related records from CSV files, calculates gross pay based on hours worked, applies statutory deductions (SSS, PhilHealth, Pag-IBIG, and withholding tax), and generates a formatted payslip-style output through the console.

This Milestone 1 document establishes the foundation for development by:

- describing the client context and the payroll problem being addressed,
- identifying user roles and needs relevant to payroll processing,
- defining functional and non-functional requirements and project constraints, and
- presenting an initial task plan with effort estimates, dependencies, and a timeline to guide implementation in the next milestone.

2. Client Background

MotorPH is a motorcycle parts manufacturing and retail company used as the client case for this project. The organization operates with approximately 34 employees distributed across key departments such as Executive, Operations, Human Resources, Payroll, Finance, IT, and Accounting. Because payroll activities involve multiple roles and sensitive employee data, the company requires a consistent and reliable method for computing employee pay and deductions.

For this milestone, MotorPH serves as the context for developing a payroll automation solution that can support basic payroll computation and reporting within the constraints of MO-IT101. The reference website for the case study is: https://sites.google.com/mmdc.mcl.edu.ph/motorph/home?authuser=0

3. Problem and Need Analysis

MotorPH currently processes payroll using manual or semi-manual methods, which requires payroll staff to compute salaries and deductions through repeated encoding and checking. This approach is time-consuming and increases the chance of errors, especially when multiple deduction rules must be applied consistently for every employee.

The manual payroll process results in the following key issues:

- **Payroll computation errors:** Gross pay, deduction amounts, and net pay may be miscalculated due to manual computation.

- **Delayed salary release:** Payroll processing takes longer because calculations and verification are done by hand.

- **Compliance risk:** Inconsistent application of statutory deductions (SSS, PhilHealth, Pag-IBIG, and withholding tax) may lead to incorrect remittances.

- **Data management issues:** Employee and payroll data stored across multiple files can lead to mismatched records and repeated corrections.

As a result, MotorPH needs a simple but reliable payroll system that can standardize computations, reduce manual work, and produce consistent payroll outputs. The proposed solution should automate payroll calculation from structured data sources (CSV files) while remaining within the course requirement of a Java console-based application.

4. Project Scope and Constraints

4.1 Scope

This project focuses on developing a Java console-based payroll system for MotorPH that can automate core payroll computations using CSV-based data sources. The system will support:

- loading employee master data from CSV files,
- reading attendance or time log records to determine hours worked,
- computing gross pay based on hours worked and pay rate,
- applying statutory deductions (SSS, PhilHealth, Pag-IBIG, and withholding tax) using provided tables or rules,
- calculating net pay, and
- displaying a formatted payslip-style summary through console output.

4.2 Constraints

The development and output of the system must follow the MO-IT101 requirements:

- **Platform:** Java console application only (text-based interface, no GUI).
- **Data Format:** Payroll-related data must be sourced from CSV files.
- **Output:** Results will be displayed in the console (payslip summary and computed values).
- **Scope Limitation:** Advanced features such as web access, databases, and graphical interfaces are outside the scope of this milestone.

4.3 Assumptions

To proceed with the design and planning, the following assumptions are used:

- employee records and deduction tables are available and readable in CSV format,
- attendance logs follow a consistent structure that allows hours to be computed, and
- lunch break handling will only be applied if explicitly required by the dataset or rules.

5. Requirements Specification

5.1 Users and Roles

The system is designed around the needs of the following users:

- **Employee (View Only):** needs access to personal payroll information and a readable payslip summary.
- **Payroll Staff:** needs to process payroll computations accurately and consistently using attendance and deduction rules.

5.2 Functional Requirements

The system must be able to:

FR-01 Display Employee Information — The system must read employee records from the MotorPH employee CSV file and display the following fields for each employee: Employee Number, Last Name, First Name, SSS Number, PhilHealth Number, TIN, Pag-IBIG Number, Status (Regular/Probationary), Position, and Basic Monthly Salary Rate. These fields are required before any payroll computation can begin.

FR-02 Read Attendance Logs and Compute Hours Worked — The system must read daily time-in and time-out records from the attendance/time log CSV file. For each employee per payroll period, it must calculate total regular hours worked by computing the difference between time-in and time-out for each day, then summing those values across the period (Monday–Friday, 8 hours/day standard). Late arrivals and undertime must be tracked and flagged.

FR-03 Compute Gross Weekly Salary — The system must compute the employee's hourly rate from the Basic Monthly Salary (Monthly Salary ÷ 22 working days ÷ 8 hours). Gross pay is

then computed as: Hourly Rate × Total Regular Hours Worked. Overtime hours, if any, are computed separately at the applicable overtime rate.

FR-04 Apply SSS Deduction — The system must determine the correct SSS contribution using the official SSS Contribution Table (bracket-based). The employee's gross monthly salary is used to look up the applicable contribution bracket, and the corresponding employee share is deducted from the gross pay. The employer share is also computed but not deducted from the employee.

FR-05 Apply PhilHealth Deduction — The system must compute the PhilHealth contribution as 5% of the employee's Basic Monthly Salary, divided equally between employer and employee (employee share = 2.5%). The total monthly employee deduction must not exceed the PhilHealth ceiling as defined by current regulations.

FR-06 Apply Pag-IBIG Deduction — The system must compute the Pag-IBIG contribution based on the employee's gross monthly salary. Employees earning above PHP 1,500/month contribute 2% of monthly salary. The maximum monthly employee contribution is capped at PHP 100.00.

FR-07 Compute Withholding Tax — The system must compute withholding tax using the BIR tax bracket table based on the employee's taxable income (Gross Pay minus non-taxable deductions and benefits). Tax is computed monthly using the applicable bracket rate and fixed tax amount per bracket. Late/undertime deductions are applied before computing taxable income.

FR-08 Compute Net Pay — The system must compute the employee's Net Pay using the formula: Net Pay = Gross Pay − (SSS + PhilHealth + Pag-IBIG + Withholding Tax + Late/Undertime Deductions). The result is the final amount due to the employee for the payroll period.

FR-09 Display Formatted Payslip Summary — The system must display a formatted payslip-style console output per employee that includes: Employee Number, Name, Position, Gross Pay, itemized statutory deductions (SSS, PhilHealth, Pag-IBIG, Withholding Tax), other deductions (Late/Undertime), Total Deductions, and Net Pay. The output must be readable, clearly labeled, and consistent across all employees.

5.3 Priority Matrix

No.	Requirement	Priority
1	Display employee information	High
2	Calculate hours worked from attendance logs	High
3	Compute gross pay	High
4	Apply SSS deduction	High
5	Apply PhilHealth deduction	High
6	Apply Pag-IBIG deduction	High
7	Compute withholding tax	High
8	Compute net pay	High
9	Display payslip summary	Medium

5.4 Non-Functional Requirements

- **Correctness and reliability:** computed outputs must follow the provided tables and rules consistently.
- **Maintainability:** the program should be modular, readable, and easy to update when tables or rules change.

- **Usability (console output):** results must be displayed in a clear and consistent format that users can read easily.
- **Portability:** the program must run on standard Java environments used for the course.

5.5 Input and Output Requirements

- **Inputs:** CSV files containing employee details, deduction tables, and attendance or time logs.
- **Outputs:** console display of employee details, computed payroll values, and a payslip-style summary for the period.

6. Solution and Alternatives Design

6.1 Proposed Solution

The proposed solution is a **Java console-based MotorPH Payroll System** that automates payroll computation using CSV-based records. The system will:

- load employee master data and statutory deduction tables from CSV files,
- process attendance or time log data to compute total hours worked,
- compute gross pay using hourly rate and hours worked,
- apply statutory deductions (SSS, PhilHealth, Pag-IBIG) and withholding tax, and
- compute and display net pay through a formatted payslip-style console output.

This approach prioritizes accuracy and consistency while staying within MO-IT101 scope.

6.2 Alternatives Considered

Option	Advantages	Limitations	Decision

Spreadsheet-based payroll	Familiar and easy to set up	Manual steps remain, high risk of errors, difficult to standardize	Rejected
Web-based payroll system	Accessible, scalable, user-friendly	Requires web development, databases, security, beyond MO-IT101 scope	Rejected
Java console application	Meets course scope, supports automation, focuses on core Java concepts	Text-only interface, limited user experience	Selected
Desktop GUI application (JavaFX)	Better interface than console	GUI is beyond MO-IT101 scope and adds complexity	Rejected

6.3 Justification for Selected Approach

The **Java console application** is selected because it satisfies MO-IT101 constraints while directly addressing the payroll problem. It also supports fundamental programming outcomes, including file input/output, data parsing, conditional logic for deduction rules, loops for processing multiple records, and modular design for maintainability and testing.

7. Task Identification and Work Breakdown

This section identifies the major tasks required to complete the payroll system and breaks them down into manageable development activities aligned with the Milestone plan.

7.1 Major Development Tasks

1. **Requirements and documentation**
    - Review MotorPH payroll context and confirm scope
    - Finalize requirements, assumptions, and constraints for submission
2. **Visual planning**
    - Create use case diagram (actors, use cases, system boundary)
    - Create wireframes for key screens (menu, employee details, payslip output)
3. **Employee information module**
    - Read employee master data from CSV
    - Validate and display employee details in the console
4. **Attendance processing module**
    - Read attendance/time logs from CSV
    - Compute total hours worked for the payroll period
5. **Payroll computation module**
    - Compute gross pay using hourly rate and computed hours

    - Prepare data structures for deduction and tax computation

6. **Deductions module**
    - Apply SSS deduction using bracket lookup
    - Apply PhilHealth deduction using rate rule and limits
    - Apply Pag-IBIG deduction using rate rule and cap
    - Compute withholding tax using bracket rules
7. **Net pay and payslip output**
    - Compute net pay (gross pay minus all deductions)
    - Display formatted payslip-style summary through console output
8. **Testing and validation**
    - Run sample payroll computations
    - Validate results using provided tables and sample cases
    - Handle edge cases (missing fields, invalid formats, boundary values)

7.2 Effort Estimate

The following table provides a detailed effort estimate for each major development task, including complexity rating and estimation rationale.

Task 1: Requirements and Documentation

- Estimated Hours: 2 hrs | Complexity: Low

- Rationale: Review MotorPH payroll context, finalize scope, write introduction, client background, problem analysis, and constraints. Template-guided and straightforward for a solo developer.

Task 2: Use Case Diagram and Wireframes

- Estimated Hours: 3 hrs | Complexity: Medium
- Rationale: Requires accurate UML notation for the corrected 2-actor use case diagram (Employee and Payroll Staff) and 3 wireframe screens (Login, Bulk Payroll Processing, and Information/Payslip Message screens) aligned to FR-01 through FR-09.

Task 3: Employee Information Module

- Estimated Hours: 3 hrs | Complexity: Low
- Rationale: Read employee records from MotorPH CSV, parse and validate all required fields (Employee No., Name, Position, SSS No., PhilHealth No., TIN, Pag-IBIG No., Status, Salary Rate), and display in console. Straightforward file I/O and string parsing in Java.

Task 4: Attendance Processing Module

- Estimated Hours: 4 hrs | Complexity: Medium
- Rationale: Parse time-in and time-out entries from attendance CSV per employee per day, compute daily hours worked, sum across the payroll period (Mon-Fri, 8 hrs/day standard), and track late arrivals and undertime. Requires careful time arithmetic and edge case handling.

Task 5: Gross Pay Computation

- Estimated Hours: 2 hrs | Complexity: Low
- Rationale: Derive hourly rate from Basic Monthly Salary (Monthly Salary ÷ 22 days ÷ 8 hrs), then multiply by total regular hours worked. Simple formula; depends on attendance module output.

Task 6: Statutory Deductions (SSS, PhilHealth, Pag-IBIG)

- Estimated Hours: 5 hrs | Complexity: High
- Rationale: Three separate deduction rules must be implemented accurately: SSS using bracket-based contribution table lookup; PhilHealth at 5% of monthly salary with 2.5% employee share and ceiling cap; Pag-IBIG at 2% of monthly salary capped at PHP 100.00. Requires referencing official government contribution tables.

Task 7: Withholding Tax Computation

- Estimated Hours: 3 hrs | Complexity: High
- Rationale: Compute taxable income (Gross Pay minus non-taxable deductions), then apply BIR monthly tax bracket table with fixed tax amounts and marginal rates per bracket. Late/undertime deductions must be applied before computing taxable income. Requires careful bracket lookup logic.

Task 8: Net Pay and Payslip Output

- Estimated Hours: 2 hrs | Complexity: Low
- Rationale: Compute Net Pay = Gross Pay - (SSS + PhilHealth + Pag-IBIG + Withholding Tax + Late/Undertime Deductions), then display a formatted payslip-style console summary per employee with all computed values clearly labeled.

Task 9: Testing and Validation

- Estimated Hours: 4 hrs | Complexity: Medium
- Rationale: Run sample payroll computations using provided MotorPH employee and attendance data, validate results against government-provided tables and expected values, and handle edge cases (missing fields, invalid CSV formats, boundary salary values).

Total Estimated Development Time: 28 hours

8. Task Order, Dependencies, and Timeline

8.1 Task Dependencies

The tasks are arranged based on logical dependencies to ensure that required inputs and computations are available before later modules are implemented:

- Requirements and diagrams must be completed first to guide development.
- Employee data loading must be implemented before payroll computations can be performed.
- Attendance processing must be completed before gross pay can be computed.
- Gross pay must be computed before deductions and withholding tax can be applied.
- Net pay and payslip output depend on completed deductions.
- Testing and validation must occur after modules are integrated to confirm correctness.

8.2 Development Flow

1. Finalize requirements, scope, and assumptions
2. Create use case diagram and wireframes
3. Implement CSV reading and employee information display
4. Implement attendance log processing and compute total hours worked
5. Implement gross pay computation
6. Implement statutory deductions (SSS, PhilHealth, Pag-IBIG)
7. Implement withholding tax computation

8. Implement net pay computation and formatted payslip output

9. Perform testing, validation, and refinement

8.3 Timeline (Week Plan)

Week	Dates	Focus Area	Expected Output
2	Jan 13–19	Requirements	Initial analysis and scope
3	Jan 20–26	Visual Planning	Use case diagram and wireframes
4	Jan 27–Feb 2	Document Refinement	MS1 draft finalized
5	Feb 3–9	Submission Week	MS1 submitted

8.4 Project Plan

The project plan below maps each development task to its scheduled week, responsible developer, dependencies, and milestone deliverable. This plan is designed to complete the MotorPH Java Payroll System within the MO-IT101 term schedule.

Phase 1 — Planning and Documentation (Week 2, Jan 13–19)

- Tasks: Review MotorPH case, confirm project scope, write Sections 1–4 (Introduction, Client Background, Problem Analysis, Scope and Constraints)

- Responsible: Christopher Pond Maquidato
- Dependencies: None (starting task)
- Deliverable: Completed Sections 1–4 of Milestone 1

Phase 2 — Requirements and Visual Planning (Week 3, Jan 20–26)

- Tasks: Define functional requirements (FR-01 to FR-09), users/roles, priority matrix, non-functional requirements, use case diagram (2 actors), wireframes (Login, Bulk Payroll, Info Message)
- Responsible: Christopher Pond Maquidato
- Dependencies: Phase 1 must be completed (scope must be defined before requirements)
- Deliverable: Completed Sections 5 and 9 (Requirements and Diagrams)

Phase 3 — Task Planning and Effort Estimation (Week 3–4, Jan 24–Feb 2)

- Tasks: Identify major development tasks (Section 7), create effort estimates with complexity and rationale, define task dependencies, development flow (Section 8), and finalize timeline
- Responsible: Christopher Pond Maquidato
- Dependencies: Phase 2 (requirements must be finalized before tasks can be scoped)
- Deliverable: Completed Sections 6, 7, and 8 (Solution, Task Identification, Timeline)

Phase 4 — Milestone 1 Finalization (Week 4, Jan 27–Feb 2)

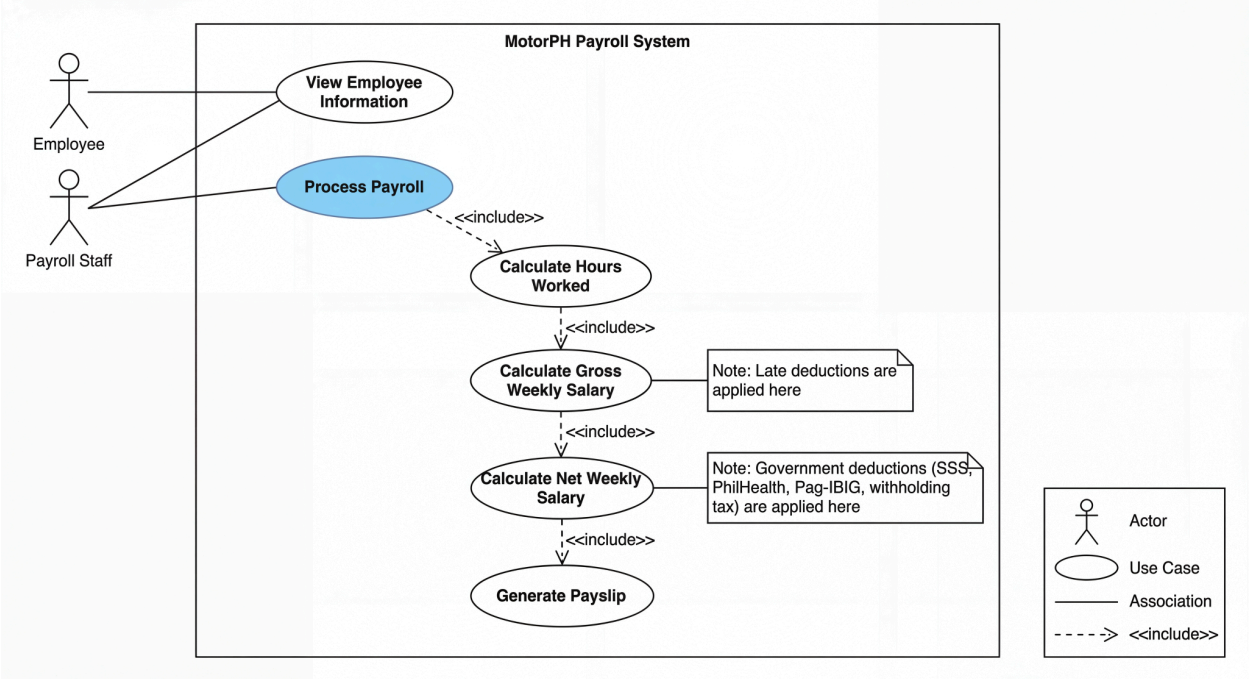
- Tasks: Review and refine all sections for completeness and consistency, verify diagrams and wireframes match requirements, proofread document, finalize formatting and naming convention
- Responsible: Christopher Pond Maquidato
- Dependencies: Phases 1–3 complete
- Deliverable: Finalized Milestone 1 document ready for submission

Phase 5 — Submission (Week 5, Feb 3–9)

- Tasks: Submit Milestone 1 via Camu LMS with Google Drive link, ensure file is viewable by anyone with MMDC email
- Responsible: Christopher Pond Maquidato
- Dependencies: Phase 4 complete
- Deliverable: MS1 submitted on Camu (MO-IT101 Milestone 1_Group 53_2nd Term_2025-2026)

9. Diagrams

9.1 Use Case Diagram



System Name: MotorPH Payroll System

Actors

- **Employee**
- **Payroll Staff**

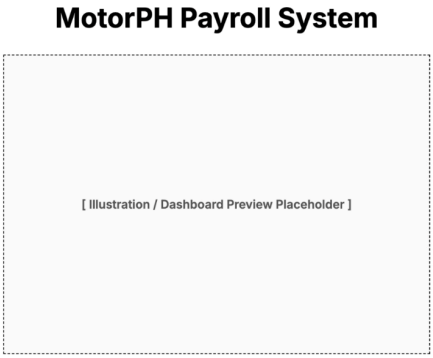
Use Cases

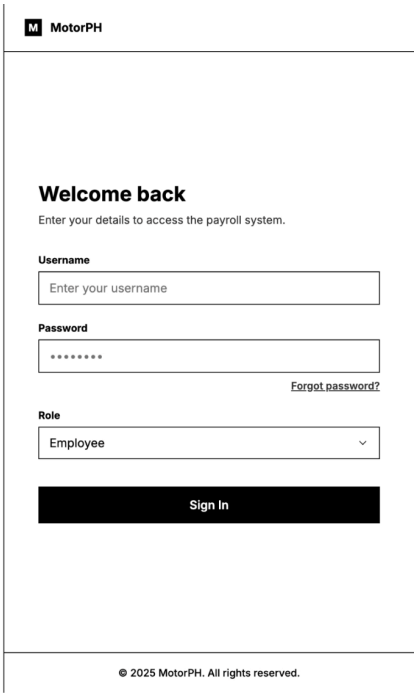
- View Employee Information
- Calculate Hours Worked
- Process Payroll
- Calculate Gross Weekly Salary

- Calculate Net Weekly Salary
- Generate Payslip

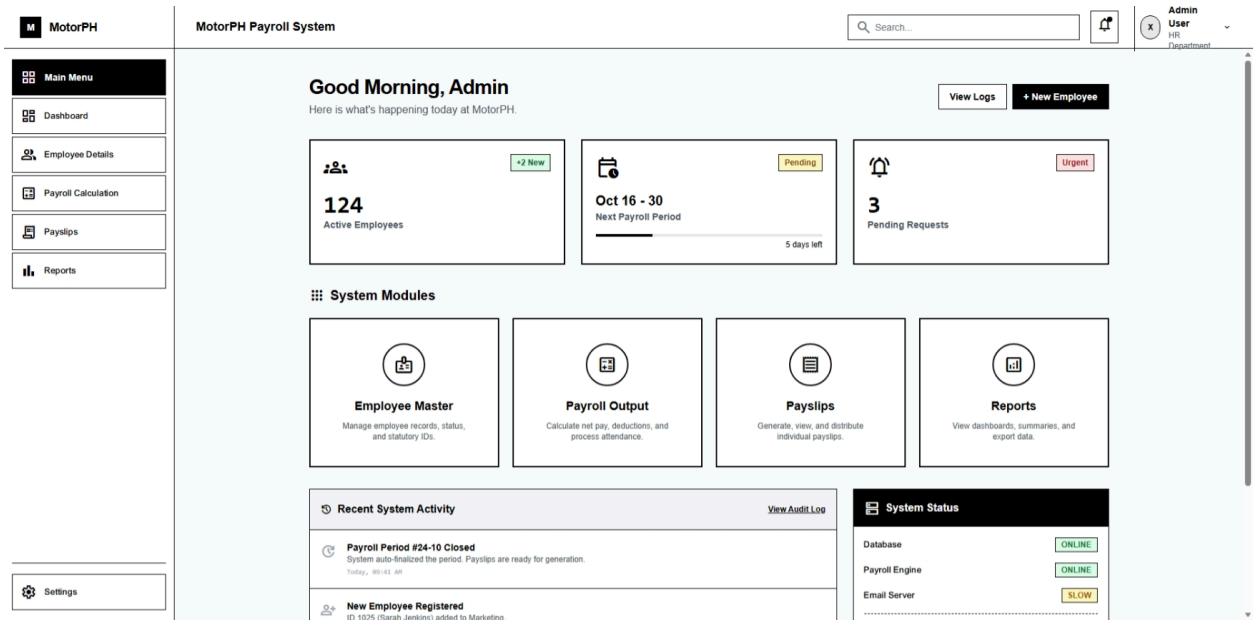
9.2 Wireframe

Login Screen

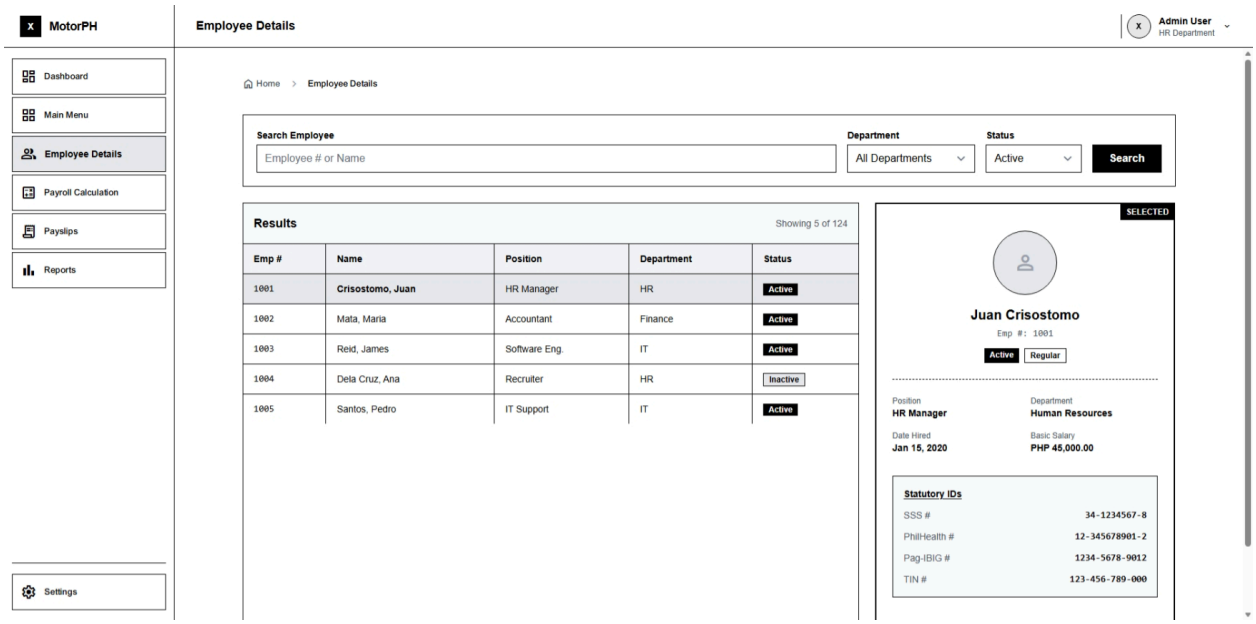




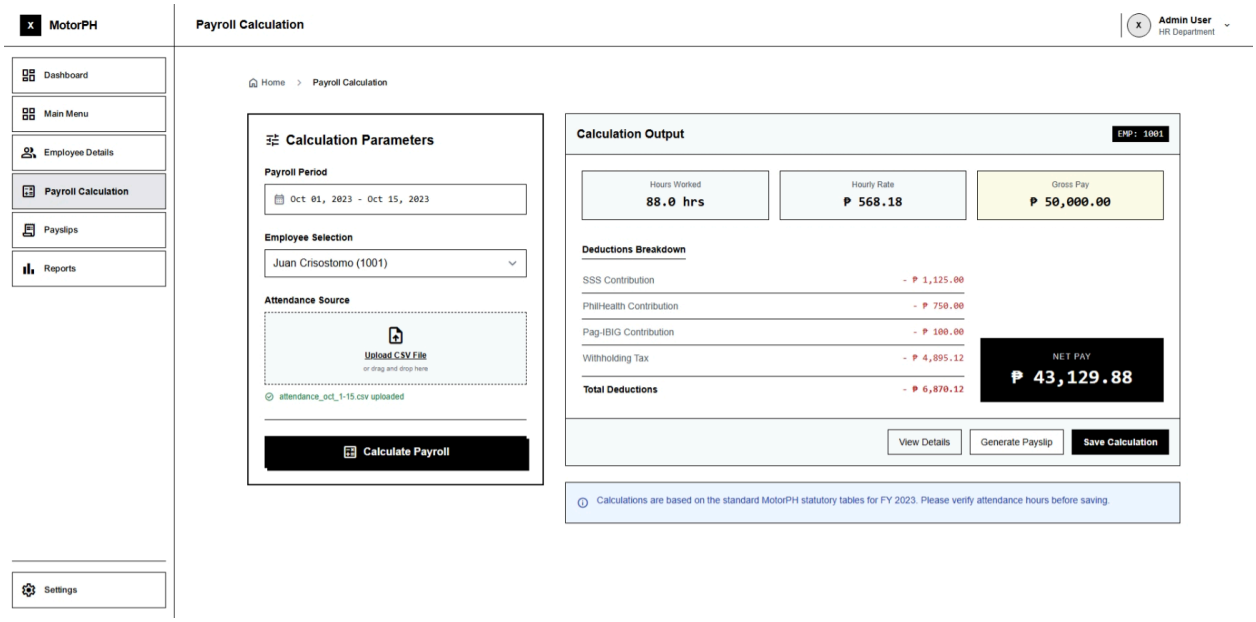
Main Menu (Central Hub)



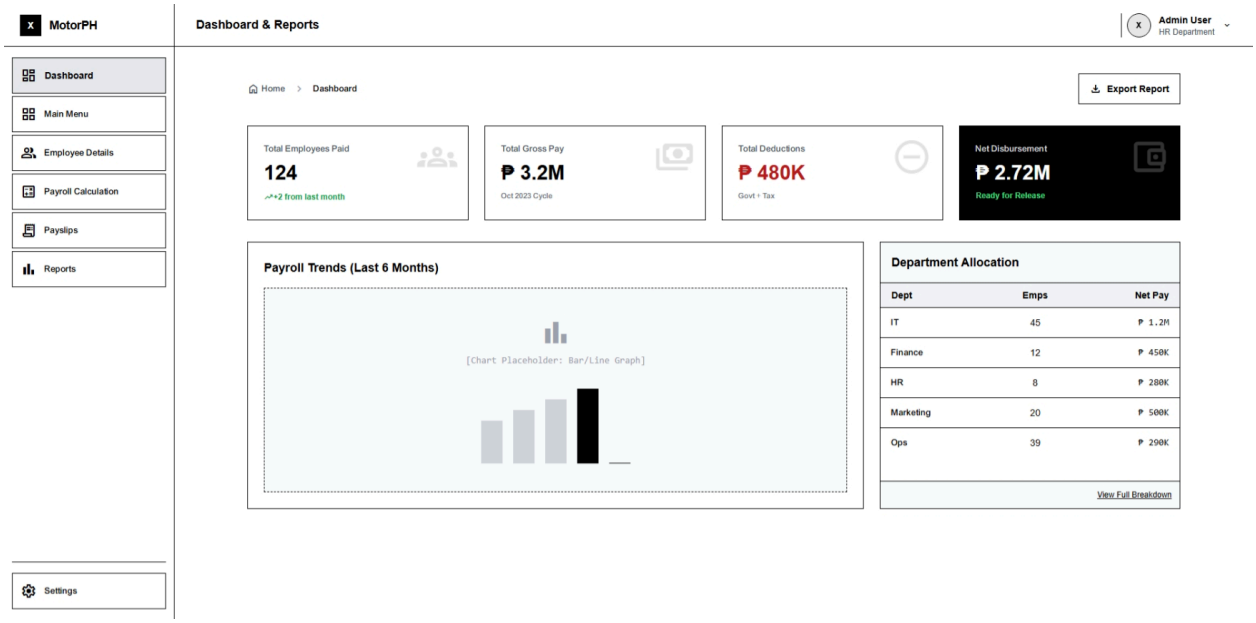
Employee Details Screen



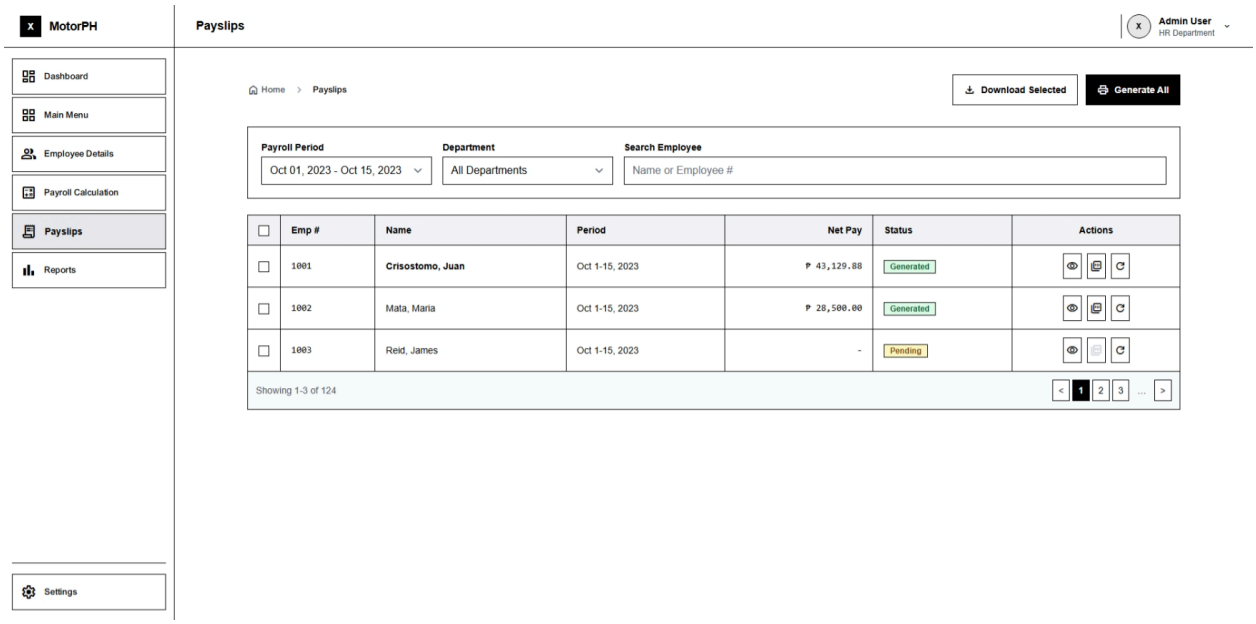
Payroll Calculation Screen



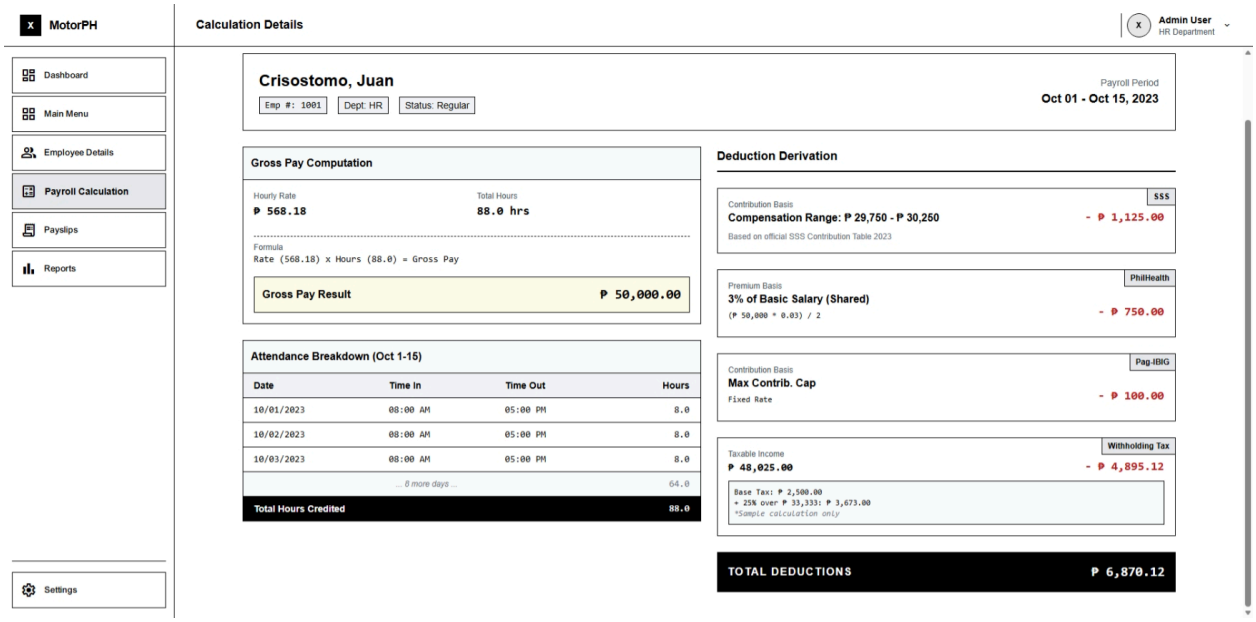
Summary Report / Dashboard



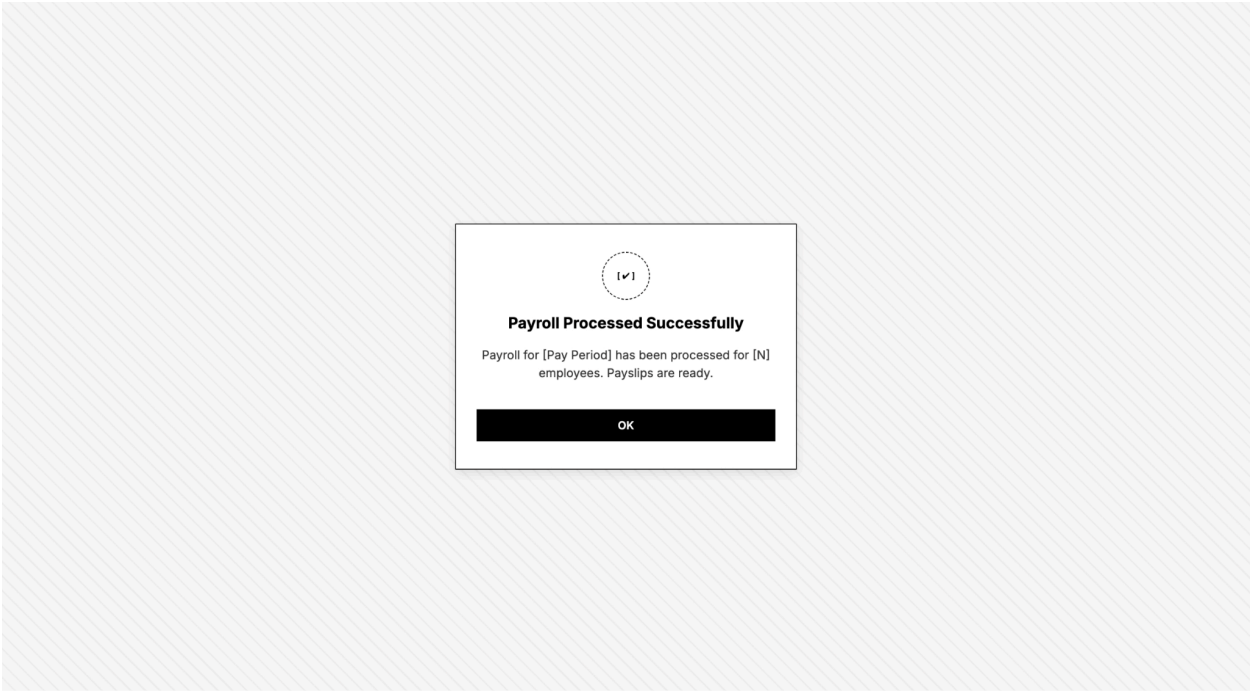
Bulk Payroll Processing Screen



Individual Calculation View



Success Message



Error Message

Confirmation Message