CONSTRUCTION PERFORMANCE MANAGEMENT AND MONITORING SYSTEM

A Project Presented to the
Faculty of the College of Computer Studies
St. Michael's College Iligan
City

In Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science in Information Technology

By

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July 2024

Chapter 3

RESEARCH METHOD

This section describes and explains the methodologies used in the study, specifically the diagrams that will be utilized in developing the system.

3. 1 Analysis Modeling

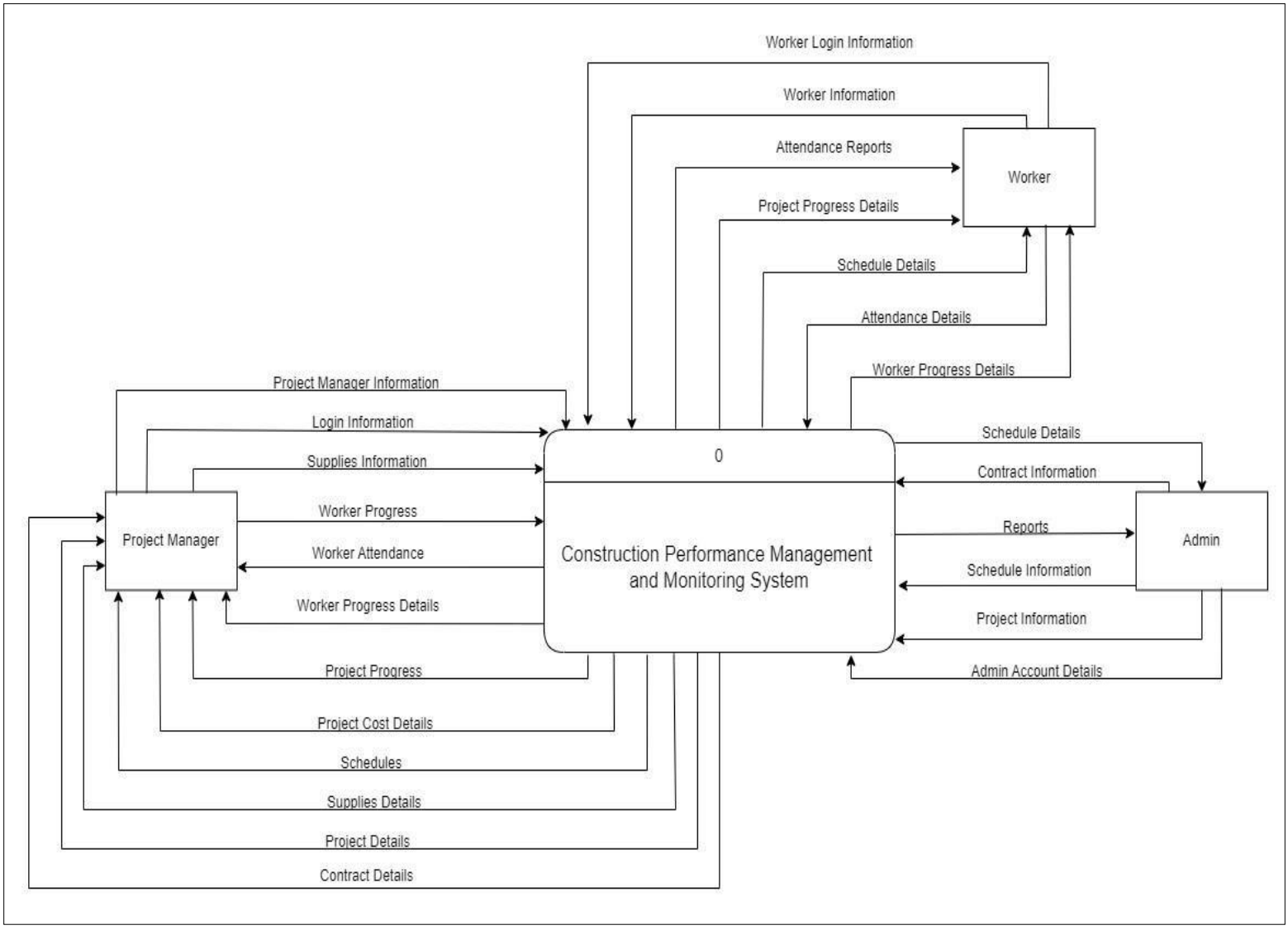

Figure 3.1 Context Diagram

Figure 3.1 shows how the system will operate. There will be three entities involved with the system which are the project manager, the admin, and the worker. The project manager and the worker can login to the system with an account made by the admin. The project manager can input their personal information, supplies information, and the worker's progress. The system can then provide to the project manager details about the worker's progress, the project and its cost, progress, and contract, schedules, and supplies. The worker can input their attendance details through a QR code scanner provided in the system. After logging in, the system will provide to the worker details about their progress, the project's progress, schedules, and reports of their attendance record. And lastly, the admin of the system, after logging in with their account can input into the system information about the schedules, and the project and its contract. The admin will then be provided by the system with the details of the schedules, and reports of the activities in the system.

3.2 System Design

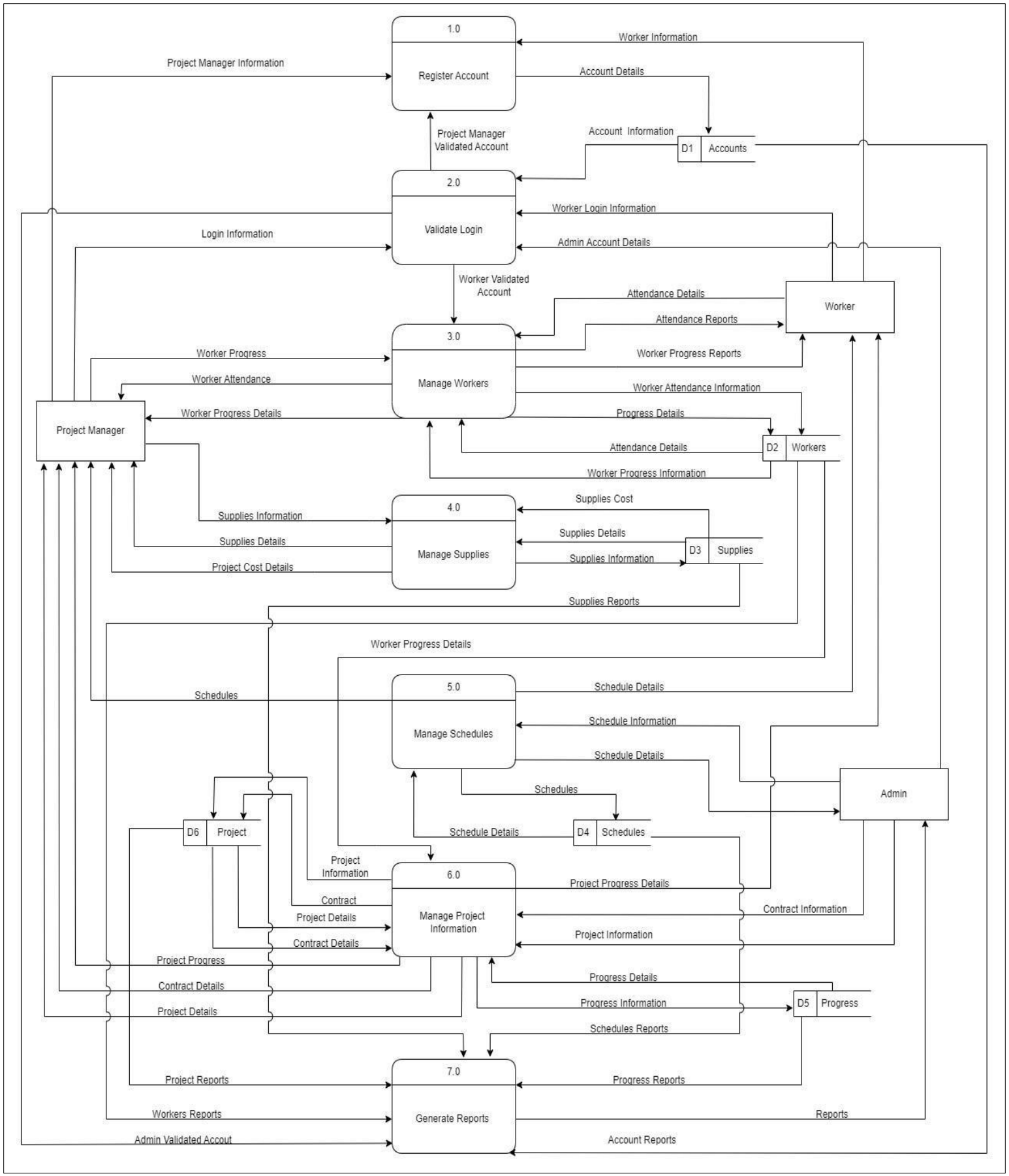

Figure 3.2 Data Flow Diagram

Figure 3.2 shows a more detailed visualization of how the system will work. The system consists of three entities, seven processes, and six databases.

Process 1 is where the admin will register accounts with the information coming from both the worker and the project manager. The details of the accounts will then be stored in the database named accounts.

Process 2 shows the validation of the accounts by the system. The system will check whether the account inputted is found in the database or not. If the account is valid, the system will then check for the account's access level and redirect the account to the appropriate page for the account.

Process 3 is where the system will manage all of the activities relating to the workers. The system will receive the worker's progress from the project manager, as well as the attendance from the worker through a QR code scanner and store them in the database workers. The system will then provide the project manager details about the worker's progress and attendance, and provide the workers reports of their progress and attendance with information coming from the database worker.

Process 4 indicates how the system manages the activities relating to the supplies from the construction project. The project manager can input the supplies

information and the system will store them in the database supplies. The system will then let the project manager view all the stored information in the database as well as provide a calculated cost of all the supplies.

Process 5 is all about the system managing the schedules which is inputted by the admin into the system. The system will then store the information into the database named schedules and provide all the entities with the details of the schedules that are coming from the database.

Process 6 shows how the system will manage all of the information about the project. The system will take input from the admin for the project's information and contract and store them in the database called project. The system will then provide the project manager with details coming from the database about the project and its contract. The system will then use the progress of the workers from the database workers to calculate the overall progress of the project. The calculated progress will then be made available by the system for viewing for the project manager and the workers.

And lastly, Process 7 indicates how the system will generate reports of the system. All the stored data in all of the databases will be gathered by the system and provide a way of viewing it for the admin.

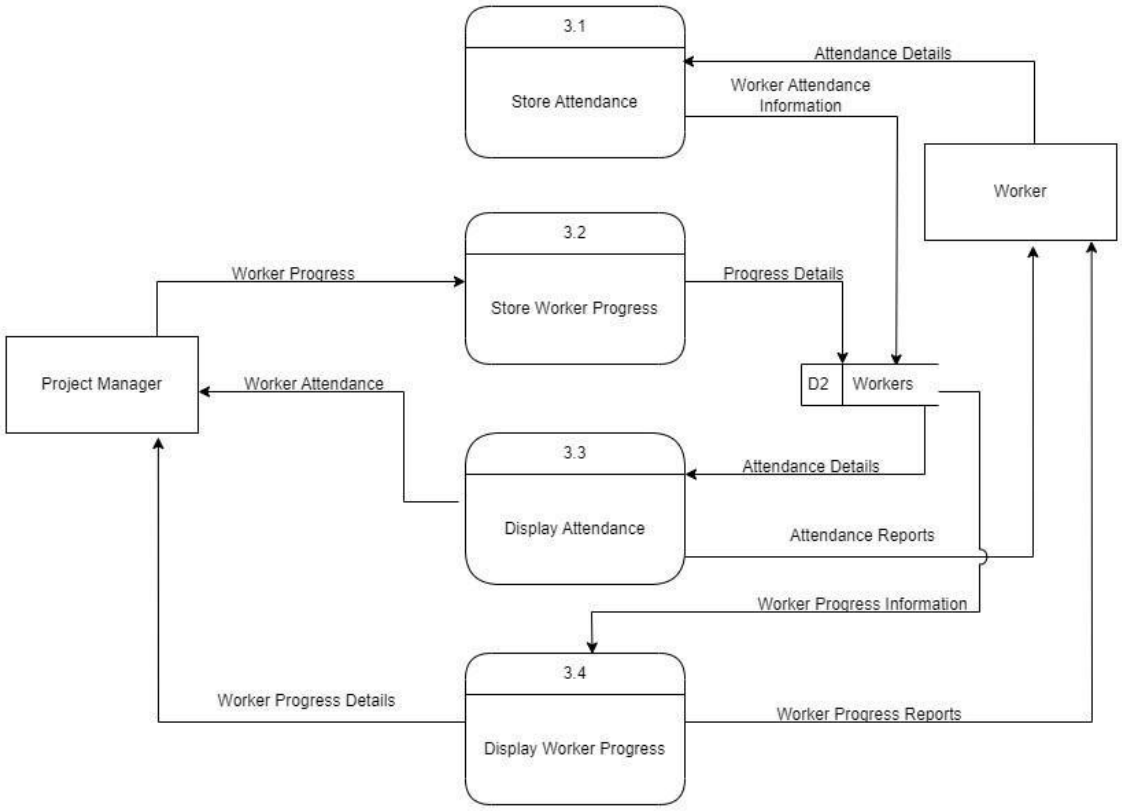

Figure 3.2.1

The third process can be broken down into four processes. The first process stores the attendance of the worker into the database workers. The second process acquires the worker's progress from the project manager and stores it to the database. For the third and fourth processes, the system will display the attendance and the worker's progress from the database to both the project manager and the worker.

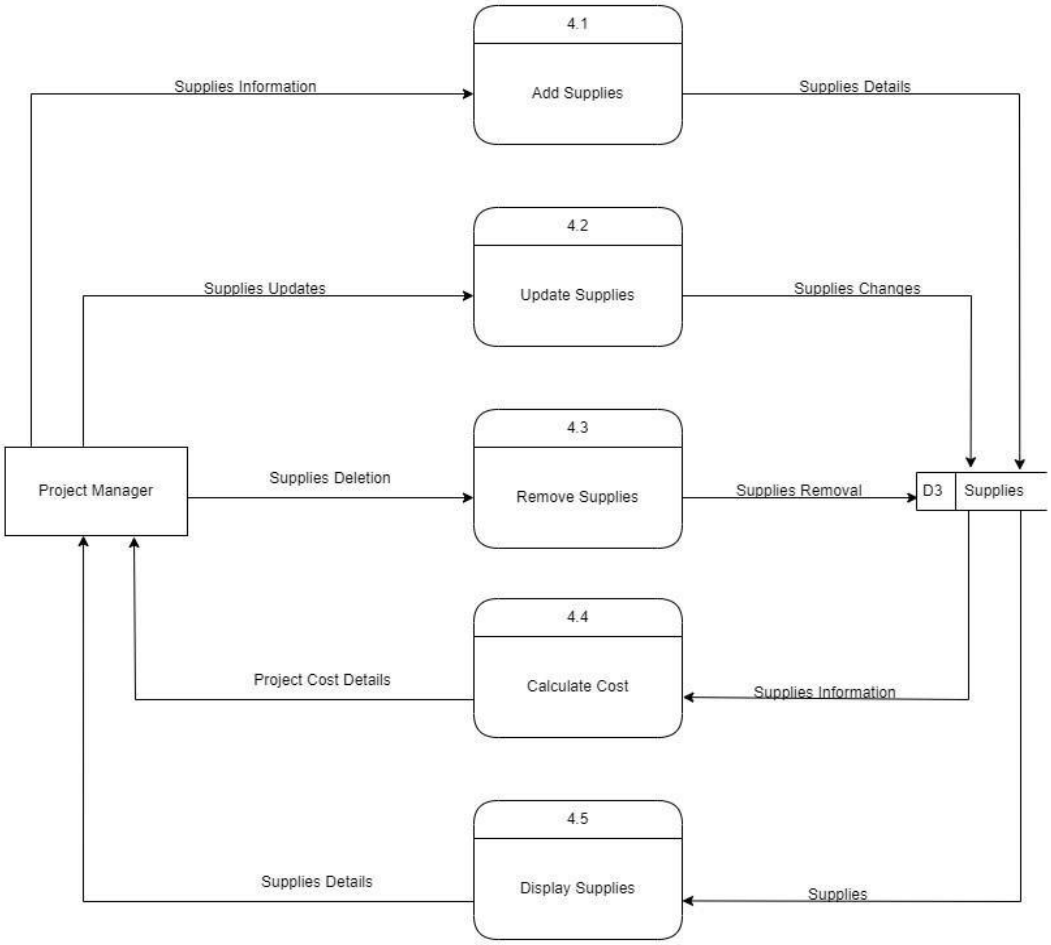

Figure 3.2.2

The fourth process can be broken down into five processes. The first three processes are for managing the supplies information. The project manager can add supplies information into the database supplies, and update, or delete the supplies information that is stored in the database. In the fourth process, the system will provide a calculated cost of the supplies stored in the database. And lastly, the fifth process displays the stored supplies information in the database to the project manager.

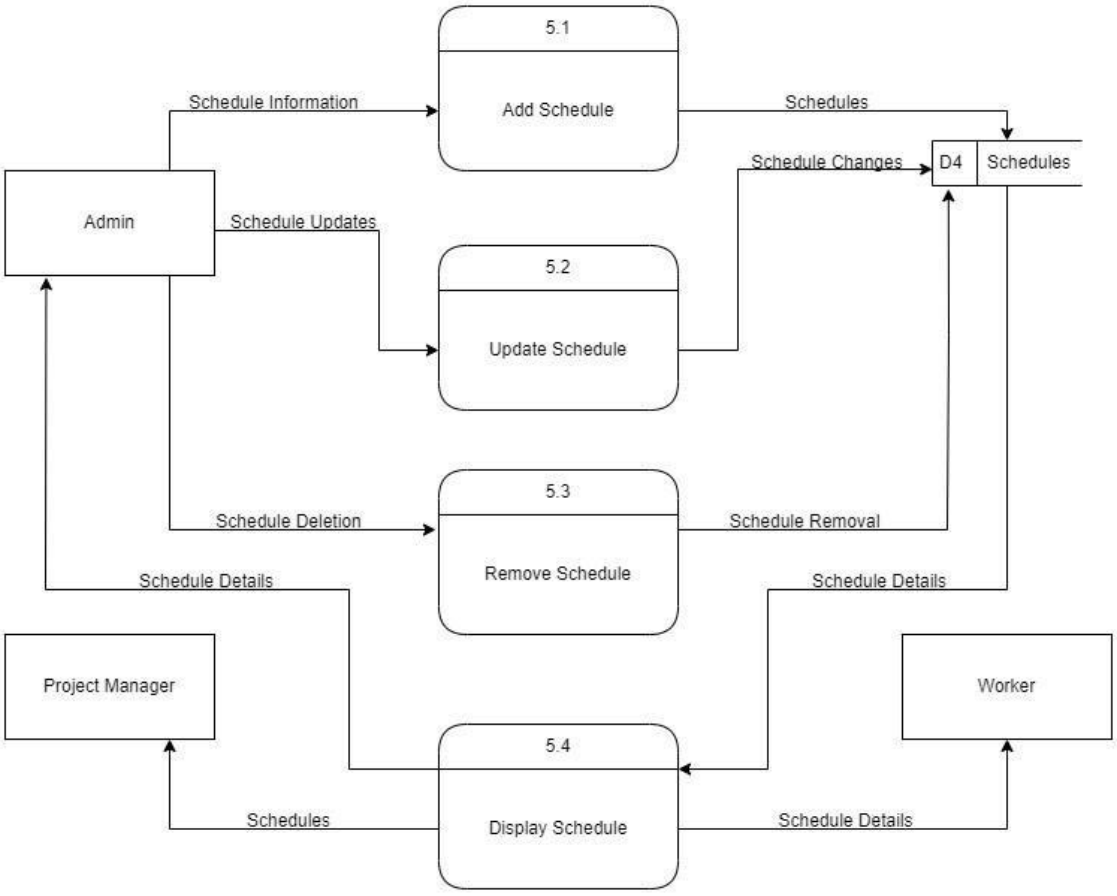

Figure 3.2.3

The diagram above shows the decomposition of the fifth process in the data flow diagram. The system can add schedules that are inputted by the admin into the database schedules. The admin can then perform update and delete actions toward the schedules that are stored in the database. And lastly, the system will display the stored schedules into the admin, the project manager, and the worker.

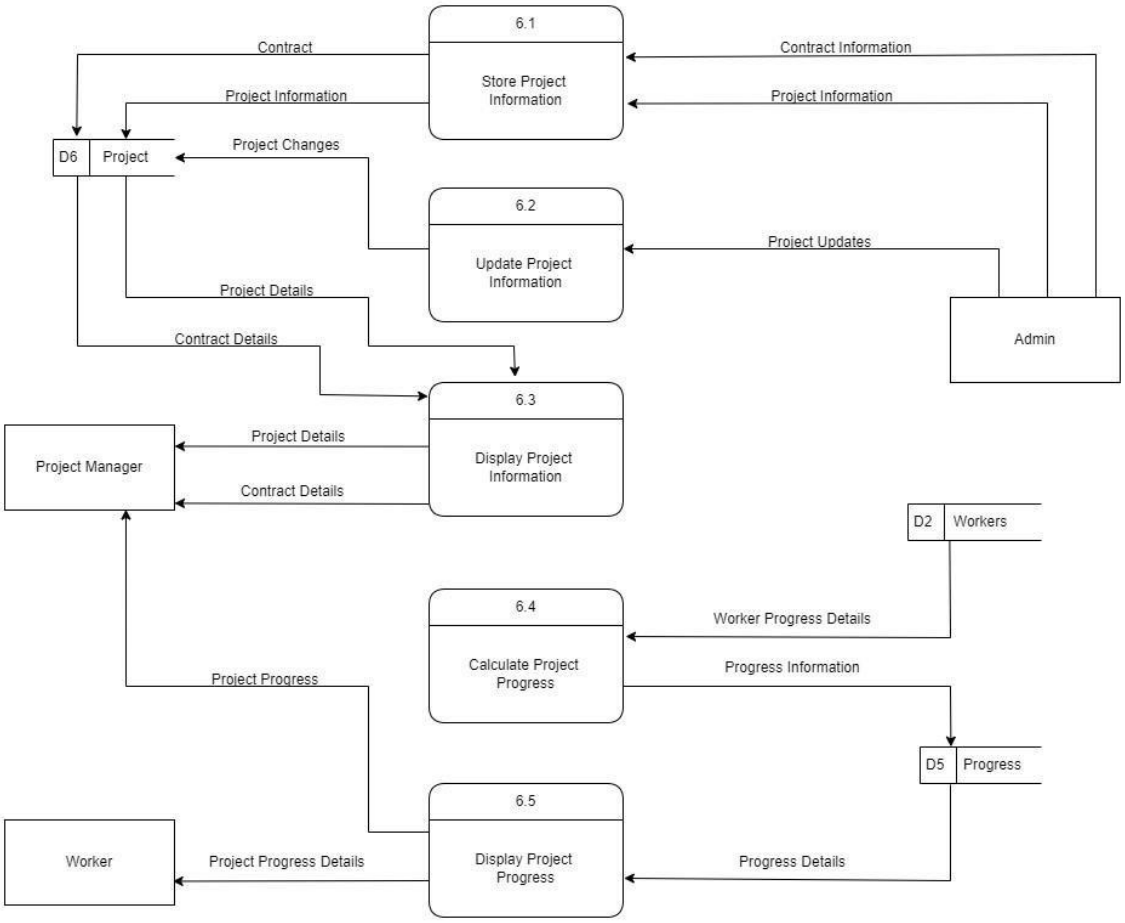

Figure 3.2.4

The sixth process can be broken down into five processes. The system lets the admin store project and contract information, and provide a way to update the stored data in the database. The third process is where the system will display all of the stored project information into the project manager. The system also uses the worker's progress from the database workers and calculates it to acquire the overall project's progress. After calculating, the system will make the data available for the project manager and the worker.

3.3 Entity Relationship Diagram

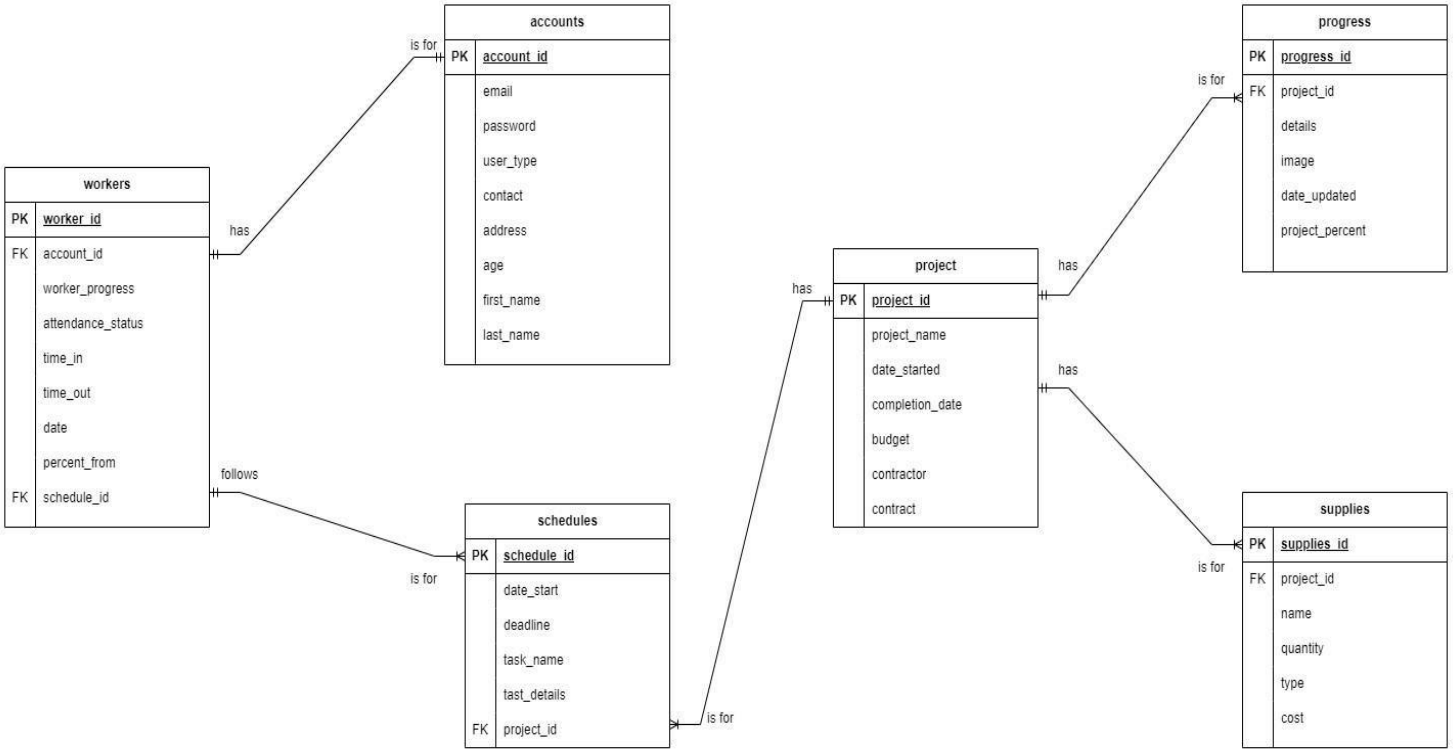

Figure 3.3 Entity Relationship Diagram

Figure 3.3 shows the attributes inside the six databases utilized in the system. The diagram showcases the relationship between all of the databases and how they contribute to one another.

3.4 Data Dictionary

The researchers have developed a data dictionary to aid individuals who need a reference for the data objects or items in the data model. The data dictionary includes tables, fields, and data types that are used in the development of the system

Accounts

Name	Type	Field Size	Description
account_id	int	50	Unique ID for accounts
email	varchar	50	Email address of user
password	varchar	50	Password for user account
user_type	varchar	50	Can be used to identify user access level
contact	varchar	50	Contact number of user
address	varchar	50	Address of user

age	int	50	Age of user
first_name	varchar	50	First name of user
last_name	varchar	50	Last name of user

Progress

Name	Type	Field Size	Description
progress_id	int	50	Unique ID for progress
project_id	int	50	Foreign Key for project database
details	varchar	50	Progress description
image	varchar	50	Image of progress
date_updated	date	50	Date of progress update
project_percent	int	50	Project's progress percent

Project

Name	Type	Field Size	Description
project_id	int	50	Unique ID for project
project_name	varchar	50	Name of Project
date_started	date	50	Project start date
completion_date	date	50	Projected project completion date
budget	int	50	Project's budget
contractor	varchar	50	Project's contractor
contract	varchar	50	Image of contract

Schedules

Name	Type	Field Size	Description
schedule_id	int	50	Unique ID for progress

date_start	date	50	Task start date
deadline	date	50	Task deadline
task_name	varchar	50	Name of task
task_details	varchar	50	Details of task
project_id	int	50	Foreign Key for project database

Supplies

Name	Type	Field Size	Description
supplies_id	int	50	Unique ID for supplies
project_id	int	50	Foreign Key for project database
name	varchar	50	Supply name
quantity	int	50	Quantity of supply
type	varchar	50	Supply type
cost	int	50	Supply cost

Workers

Name	Type	Field Size	Description
worker_id	int	50	Unique ID for worker
account_id	int	50	Foreign Key for account database
worker_progress	varchar	50	Worker's progress in percentage
attendance_status	varchar	50	Either present or absent
time_in	time	50	Time of attendance recorded
time_out	time	50	Time of leaving from work
date	date	50	Date of attendance
percent_from	int	50	Task percent compared to overall project
schedule_id	int	50	Foreign Key for schedule database

3. 5 Hardware Specifications

This section talks about the hardware specifications required for the development and deployment, and as well as the user-end requirements of the Construction Performance Management and Monitoring System.

3.5.1 Development Hardware

Minimum Computer Specifications: Processor: Intel i3 (or higher); RAM: Minimum 4GB (any type of GPU within range 4GB+) or higher; Storage: 256GB or higher.

Internet Connection: Stable internet connection, recommended 10 mbps or higher

Camera: Webcam, recommended 12 MP or higher**.**

3.5.2 Deployment Hardware

Laptop/Desktop: Minimum Intel i3 or better, 4GB RAM, with a webcam Internet Connection: Stable internet connection, recommended 10 mbps or higher.

3.6 Software Specifications

This section talks about the software specifications required for the development and deployment, and as well as the user-end requirements of the Construction Performance Management and Monitoring System.

3.6.1 Development Software

Operating System: Linux, Windows 10 or higher, or macOS.

Development Environment: HTML, CSS, JAVASCRIPT and PHP.

3.6.2 Deployment Software

Laptop/Desktop OS: Windows 10 or later, macOS Mojave or later, any recent Linux distribution.

Web Browser: Latest version of any browser available.

Appendix A. Gantt Chart

2-MONTHS GANTT CHART

PROJECT NAME	PROJECT LEAD	PROJECT START DATE	PROJECT END DATE	TODAY'S DATE
Construction Performance Management and Monitoring System	Avanzado, June Kriss E Janobas, Christian L.	June 14, 2024	July 2024	July 29, 2024

Individual columns represent weeks.

					MONTH	June					July				
					WEEK START DATE	2	9	16	23	30	6	13	20	27	-
ACTIVITY	% DONE	ASSIGNED TO	START DATE	END DATE		1	2	3	4	5	6	7	8	9	-
PHASE 1: Proposal.															
Task 1: Title Proposal	100%	Avanzado & Janobas	06/14/24	06/22/24											
Task 2: Title Approval	100%	Avanzado & Janobas	06/22/24	06/23/24											
Task 3: Creation of Survey Letter	100%	Avanzado & Janobas	06/23/24	06/24/24											
Task 4: Interview & Documentation	100%	Avanzado & Janobas	06/29/24	06/29/24											
PHASE 2: Creating of System and Chapter 1.															
Task 1: Collecting Data's	100%	Avanzado & Janobas	06/29/24	06/29/24											
Task 2: Making of Chapter 1	100%	Avanzado & Janobas.	06/29/24	06/30/24											
Task 3: Creation of PPT	100%	Avanzado & Janobas.	06/29/24	06/30/24											
Task 4: Capsule Presentation	0%	Avanzado & Janobas.	07/01/24	07/01/24											
Task 3: Revisation of Chapter 1	0%	Avanzado & Janobas.	07/01/24	07/02/24											
PHASE 3: Creation of Chapter 2															
Task 1: Gathering of Data's	0%	Avanzado & Janobas	07/03/24	07/03/24											
Task 2: Making of Chapter 2	0%	Avanzado & Janobas	07/04/24	07/05/24											
Task 3: Revisation of Chapter 2	0%	Avanzado & Janobas	07/06/24	07/06/24											
PHASE 4: Process of making Chapter 3.															
Task 1: Gathering of Data's	0%	Avanzado & Janobas	07/07/24	07/07/24											
Task 2: Making of Chapter 3	0%	Avanzado & Janobas	07/08/24	07/09/24											
Task 3: Revisation of Chapter 3	0%	Avanzado & Janobas	07/10/24	07/10/24											
PHASE 5: Finalization & Capstone Defense															
Task 1: Documents Finalization	0%	Avanzado & Janobas	07/12/24	07/13/24											
Task 2: Defense	0%	Avanzado & Janobas	07/15/24	07/16/24											

Appendix B. Permission Letter

St. Michael's College
College of Education
Quezon Ave., Iligan City, Philippines 9200

Date: 06/29/24

Leo B. Janobas
Senior Foreman
Kanooz Industrial Services

Sir Leo Janobas,

Praised be Jesus and Mary!

We, the undergraduate researchers are currently undertaking a study entitled "Construction Management Performance and Monitoring System" in partial fulfilment of the requirements for Capstone.

With due respect and honor, we would like to ask permission from your good office to allow us to conduct an interview to the selected staff of your department.

We are hoping for your favorable approval on this matter. Thank you very much and God bless!

Respectfully yours,

Avanzado, June Kriss E.
Researcher

Janobas, Christian L.
Researcher

Noted by:

LEONIE A. CAJES
Research Adviser

Edsel B. Monterola, PhD
College Dean