



De La Salle University – Manila

Term I, A.Y. 2025-2026

CCINFOM - S24

Database Application Proposal

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Submitted to:

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November 18, 2025

1.0 Group Composition

This group is composed of 4 individuals from the ID124 Batch, namely Alberto, Anton, Bernard, and Marc. Marc and Bernard are studying Information Technology. While Alberto and Anton are studying Network Information Security and Information Security respectively. This group is a combination of mutual friends that have worked together before. In relation to the course, their experience with databases is quite new at a beginner-level. Familiarity with platforms such as MySQL and GitHub is something they need to develop along the way. Despite being beginners, the group is eager to learn, work collaboratively, grow their technical and social skills to deliver a quality DB application and earn a successful grade in this course.

2.0 Rationale for DB App Development

The patch deployment system is proposed to record and monitor software patches across company machines. Many offices rely on Excel or manual recording, which makes it difficult to track failures, manage rollbacks, and assign technicians. A database application allows records of machines, patches, technicians, and maintenance actions to be linked and updated consistently. This system will support accurate task assignment, reduce errors, and provide timely reports on patch outcomes and technician performance. It will improve data consistency and help administrators make informed decisions on patch management.

3.0 Records Management

Core Records	Fields	Assigned Member
Machine Record Management	(<u>machineID</u> , machineName, deviceType, status) Viewing a record with other related records <ul style="list-style-type: none">- Viewing a specific machine record and the patch records it is associated with	Bernard Florian T. Llagas
Technician Record Management	(<u>technicianID</u> , firstName, lastName, position, email, password, status) Viewing a record with other related records <ul style="list-style-type: none">- Viewing a technician record and the list of maintenance work handled, and the list of patches released	Marc Lesley E. Quizon
Software Record Management	(<u>softwareID</u> , softwareName, type, version, releaseDate, status) Viewing a record with other related records <ul style="list-style-type: none">- Viewing a software record and the patch records it is associated with	Alberto Miguel T. Descalzo
Tester Record Management	(<u>testerID</u> , firstName, lastName, password, email, status)	Anton Luis B. Galido

	Viewing a record with other related records <ul style="list-style-type: none"> - Viewing a tester record and the feedback records associated with it 	
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Table 1. Database Core Management

Transaction Records	Fields	Assigned Member
Feedback Record Management	<p>(<u>feedbackID</u>, <u>testerID</u>, <u>patchID</u>, description, rating)</p> <p>Viewing a record with other related records</p> <ul style="list-style-type: none"> - Viewing a patch record and the feedback record associated with it 	Bernard Florian T. Llagas
Maintenance Record Management	<p>(<u>maintenanceID</u>, workType, <u>patchID</u>, <u>technicianIDAssigned</u>, dateAssigned, dateFinished, targetDeadline, status, description)</p> <p>Viewing a record with other related records</p> <ul style="list-style-type: none"> - Viewing a technician record and the list of maintenance work handled 	Marc Lesley E. Quizon Alberto Miguel T. Descalzo
Patch Record Management	<p>(<u>patchID</u>, name, type, description, releaseDate, status, <u>softwareID</u>, <u>machineID</u>, <u>technicianID</u>)</p> <p>Viewing a record with other related records</p> <ul style="list-style-type: none"> - Viewing a maintenance record and the patch record assigned to it 	Anton Luis B. Galido

Table 2. Database Transaction Management

4.0 Transactions

Transaction 1: Release new patch will involve the following data & operations assigned to Anton Luis B. Galido

Core Record involved: Software Record, Technician Record, Machine Record

Operations involved:

- Fill up the following details
 - Patch name
 - Patch type (Application, System, Programming, Network, Server)
 - softwareID
 - machineID
 - technicianID
 - description
- Validate software record:
 - + Assess if the patch type supports the software type
 - + Ensures the software exists and the status is 'Active'
 - + Check if software type is compatible with machine type (Application/system/Programming = PC OR Network = Switch/Router OR Server = server)
- Validate technician record::

- + Ensure the technician exists
- + Ensure the role is compatible with machine type (Desktop support = PC OR Network Admin = Switch/Router OR System Admin = Server)
- + Technician should have less than 3 assigned patch works and the has "Available" status
- Validate machine record:
 - + Assess if the machine status is Vulnerable (need patch)
 - + Ensure machine exists
 - + Ensure machine type is compatible with software type
- Create patch record:
 - + Add the new patch (patchID, name, type, description, releaseDate, status = "New", softwareID, machineID, technicianID)
 - + Update machine status to 'Scheduled for Patch'

Transaction 2: Send feedback on patch will involve the following data & operations assigned to Bernard Florian T. Llagas

Core Records involved: Patch Record, Maintenance Record, Tester Record

Operations involved:

- Retrieve maintenance record
 - Only show patches that have at least one maintenance record with status = "Done"
 - This ensures the tester only evaluates fully completed deployments.
- Fill up the following details
 - testerID
 - patchID
 - description
 - rating
- Validate patch eligibility
 - The patch must have an associated maintenance record with "Done" status.
- Collect feedback from tester: Based on numerical rating
- Create feedback record: Feedback to be collected from tester (feedbackID, testerID, patchID, description, rating)

Transaction 3: Schedule patch work to technician will involve the following data & operations assigned to Marc Lesley E. Quizon

Core Records involved: Machine Record, Technician Record, Software Record

Operations involved:

- Fill up the following details
 - technicianID
 - patchID
 - Work type (Deployment, Rollback)
 - description
 - targetDeadline
- Validate technician record
 - Assess if the technician is available (<3 task assigned)
- Validate patch record

- Assess if the technician's position matches the machine type in the patch record (System Admin -> Server etc.)
- Validate targetDeadline entry
 - The date chosen should not be less than NOW()
- Update technician record
 - Update the technician's status (Available or Unavailable) based on the number of tasks assigned
 - Count no. of instances technicianID appear in maintenance record with "In progress" or "Not Started" status
 - Do not count maintenance record with "Done" status
- Update machine record
 - Update the machine's status to "Scheduled for Patch"
- Create maintenance record: Serve as log records (maintenanceID, workType, patchID, technicianIDAssigned, dateAssigned, dateFinished, targetDeadline, status, description).

Transaction 4: Update maintenance record will involve the following data & operations assigned to Alberto Miguel T. Descalzo

Core Records involved: Machine Record, Technician Record, Software Record

Operations involved:

- Retrieve maintenance record: Fetch the scheduled maintenance record for the machine
- Edit the following fields:
 - patchID
 - Work type (Deployment, Rollback)
 - description
 - targetDeadline
 - status
- Validate maintenance record
 - Assess if the maintenance record is in "Not Started" or "In progress" status
 - Maintenance record with "Done" status cannot be edited
- Validate technician record
 - Assess if the technician's position matches the machine type (System Admin -> Server etc.)
- Validate patch record
 - Assess if the technician's position matches the machine type in the patch record (System Admin -> Server etc.)
- Validate targetDeadline entry
 - The date chosen should not be less than NOW()
- Update maintenance record (Only if edited)
 - Indicate new status (Not Started, In progress, Done)
 - Indicate new targetDeadline
 - Indicate new patchID
 - Indicate new workType
 - Indicate new description

5.0 Reports to be Generated

Reports Required	Information Provided	Assigned Member
Patch Success/Failure Report	Records involved: Machine Record, Software Record, Patch Record (patch Name & patch type, number of successful and failed patch deployments, success/failure rates) per patch for a given Year and Month	Anton Luis B. Galido
Technician Performance Report	Records involved: Technician Record, Patch Record, Maintenance Record For a specific technician on a specific month, the information provided are: <ul style="list-style-type: none">- Total no. of patches released- % of Working patches- % of Not Working patches- Total no. of maintenance work assigned- % of Pending patch work- % of Completed patch work- No. of late completed patch work- No. of punctual completed patch work	Marc Lesley E. Quizon
Deployment & Patch Inventory Report	Records involved: Machine Record, Maintenance Record, Technician Record (Records of deployments and rollbacks (maintenanceID, machineID, software version, technician name, maintenance type, date, status), Total number of patches, Number of machines deployed per patch, Number of machines pending deployment, Latest previous working patch available for rollback)	Alberto Miguel T. Descalzo
Patch Feedback Record	Records Involved: Tester Record, Patch Record, Feedback Record List of Tester feedback per patch, Description, Average rating per patch, Number of feedback entries per patch	Bernard Florian T. Llagas

Table 3. Database Report Generation

6.0 Declaration of Generative AI Use

The group utilized ChatGPT for getting suggestions on possible records, transactions, and reports to include for our database application. It was also used to assist in coming up with a name for the database application, ways to implement a report and how to merge some records into one main one. It was also used to generate test data for the database on MySQL.

7.0 Business Rules

Machine Record Management

1. machineID convention is "MC0001"
2. The 4 types of machines are PC, Switch, Router, and Server only
3. 'Healthy' status refers to no issues, and not in need of a patch
4. 'Vulnerable' status refers to issues present, needs patch
5. 'Scheduled for Patch' status refers to a machine that has been assigned for patch work
6. The status field can only be edited to 'Healthy' or 'Vulnerable' by the technician
7. The status field will automatically be set to "Scheduled for Patch" when the machine's associated patch record is assigned to a technician through Transaction 3
8. Deletion will change the machine's status to "Inactive", this action is allowed only when the machine has no associated maintenance record with "Not Started" or "In progress" status.

Technician Record Management

1. technicianID convention is "TH0001"
2. Each technician's email should be unique
3. Newly added technicians will have a default status field "Available"
4. The status field can not be edited directly by the technician, it modifies dynamically depending on the number of patch work assigned to the technician
5. Technician's password should be at least 6 characters
6. 'Desktop Support' technicians will only work with PC machines
7. 'Network Admin' technicians will only work with Switch, and Router machines
8. 'System Admin' technicians will only work with Server machines
9. 'Available' status refers to Technician with less than 3 patch work assigned
10. 'Unavailable' status refers to Technician with exactly 3 patch work assigned
11. An "assigned patch work" refers to a maintenance record the technician is assigned to, with a "Not Started" or "In progress" status.
12. Maintenance record with "Done" status are not counted in the no. of assigned patch work of a technician
13. Deletion of a technician record will just change the status to "Inactive", this can only be done if the technician has no "Not Started", or "In progress" patch work
14. "Inactive" Technicians cannot login

Software Record Management

1. softwareID convention is "SF0001"
2. The 5 types of software are Application, System, Programming, Network, and Server only
3. 'Application', 'System', 'Programming' software is only for PC machines
4. 'Network' software is only for Router, and Switch machines
5. 'Server' software is only for Server machines
6. Deleting a software record refers to changing the status to "Inactive". The status of the software record should also be able to be reactivated which would change the status back to "Active" at any time.

Tester Record Management

1. testerID convention is "TS0001"
2. Deleting a tester record would simply change its status to "Inactive"
3. "Inactive" Testers cannot login

Maintenance Record Management

1. maintenanceID convention is "MT0001"
2. The 2 types of maintenance work are Deploy, and Rollback only
3. The status field will either be "Not Started", "In progress", "Done"
4. Adding a new maintenance record is only done through Transaction 3
5. Editing a maintenance record is only done through Transaction 4, maintenance record with "Done" status cannot be edited
6. A maintenance record can only be deleted when the status is "Done", deleting pertains it will no longer exist in the database

Patch Record Management

1. patchID convention is "PT0001"
2. The 5 types of patches are Application, System, Programming, Network, and Server only
3. Adding a new patch record is only done through Transaction 1
4. Each patch record must have a description
5. Deleting a patch record will just change the status to "Inactive"

Feedback Record Management

1. feedbackID convention is "FB0001"
2. Adding a new feedback record is only done through Transaction 2
3. Only testers are allowed to add, edit, delete feedback records
4. Deleting a feedback record refers to full deletion of the record, it will no longer exist in the database

Transaction 1: Release new patch

1. The patch type must be equal to the software type of the software record
2. The software type must correspond to the machine type of the machine record
3. The machine's status should be 'Vulnerable'
4. One technician can release multiple unique patches
5. A new patch record will have a default 'New' status

Transaction 2: Send feedback on patch

1. A tester can only provide feedback on a patch record with a corresponding maintenance record with "Done" status
2. One patch can receive multiple feedback from multiple testers

Transaction 3: Schedule patch work to technician

1. The Technician's status must be 'Available (less than 3 assigned tasks)

2. The Technician's position must correspond to the type of machine assigned in the patch record (e.g., System Administrator -> Server).
3. For a "Deployment" work type, the assigned Patch must have either "New" or "Working" status
4. For a "Rollback" work type, the assigned Patch must have "Not Working" status
5. A patch work can only be assigned to 1 technician
6. A new maintenance record will have a default 'Not Started' status

Transaction 4: Update maintenance record

1. The technicianIDassigned is not editable, patch work can not be reassigned to another technician
2. If the patchID is edited, the Technician's position should still correspond to the type of machine assigned in the patch record (e.g., System Administrator -> Server).
3. If the workType is edited to "Deployment", the assigned Patch must have either "New" or "Working" status
4. If the workType is edited to "Rollback", the assigned Patch must have "Not Working" status

8.0 PatchTrackerDB Relational Database Model

