Students Details	
Module Name:	Data Management - 2
Module Lecturer/ Course Coordinator:	Ms. Sumudu
Department:	School of Computing & Engineering
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Students Details:

	Student No.	**Student Name**
01	COHNDSE241F-044	GUNAWARDENA A.W.W.A.M.D
02	COHNDSE241F-100	RAJASINGHE R.B.L
03	COHNDSEF241F-101	DISSANAYAKE D.R.C.M.T
04	COHNDSE241F-102	CHAMUDITHA G.A.P.S
05	COHNDSE241F-103	M.I.M SAJID
06	COHNDSE241F-108	AMJATH M.T.M

NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

HIGHER NATIONAL DIPLOMA IN SOFTWARE ENGINEERING

COURSEWORK

DATA MANAGEMENT - 2

Hospital Management System

CONTENTS

SUMMARY

The Hospital Management System is a manageable system where internal entities can manage their resources. So, in this it tries to be manage for middle range Hospital where it contains all the manageable tables to be get thorough check in day-to-day life. The features may relate to an ER diagram and schema based on the requirements gathered from the client. It tries to identify all the entities and their relationships through an ER diagram and schema. This how the client will be stored data and make changes to the data from the system by using database. They can make their endless predictive on this through tables. So, they can make some privileges and make it secure, backup all the data and as well as the try to be safe to cloud service provide. To retain the data back it is very efficient and user friendly to retain it. So that they can make predictive research of their hospital management through reports. It is cleared that it needs to have these features that the database server must keep the data for future needs.

1. CHAPTER 01 - Introduction

1.1 Introduction

Effective management of hospital operations ensures smooth delivery of healthcare services. It is a streamline process involved in managing patients, ward, surgery, doctor details. This system enhanced to provide data accuracy, manual error reductions and improve the overall efficiency of hospital administration and user management.

1.2 Database Platform Justification: Oracle Database Server

As for the development of Hospital Management System, oracle server has been selected as the server to do backend due to its advanced features, scalability, security.

It is a widely used server nowadays which is suitable for large scale organization to keep a large set of data very Efficiently.

2. CHAPTER 02 – Requirement Engineering

2.1 Problem Definition

Managing the hospital operations could be related as the complex challenging due to its complex healthcare services such handling large number of patients, maintaining transactional services, inventory services. Many hospitals rely on the digital system where they can keep the data stored in many locations in many servers as connected through software due to its insufficient system or outdated system or file-based system.

2.2 Problem Solution

As the solution we can consider have identified the key areas that affect on hospital through file based or outdated system. In conclusion we came across with database designed with system for them to keep their data for more future needs.

2.3 Requirement Analysis

2.3.1 Functional Requirements:

- **Admin Management**: The system should allow the main admin to manage multiple admins (ward admin, doctor admin, surgery admin, etc.), each with specific responsibilities.
- **Doctor Management**: The doctor's admin should be able to add, modify, search, and manage doctor profiles and reports.
- **Patient Management**: The patient admin should manage patient details, add new patients, update information, generate patient reports.
- **Surgery Management**: Surgery admins should handle surgery schedules, add, and update surgeries, and generate reports.
- **Room and Bed Management**: Ward admins should manage the rooms and bed availability, including updates on room status and bed counts.
- **Appointment Handling**: The system should support booking, modifying, and canceling patient appointments for doctors and surgeries.
- **Leave Request Handling**: Doctors and other staff should be able to request leave, and admins should be able to approve or deny them.
- **Payment System**: Should solve patient payments and with integration of surgery and appointments.

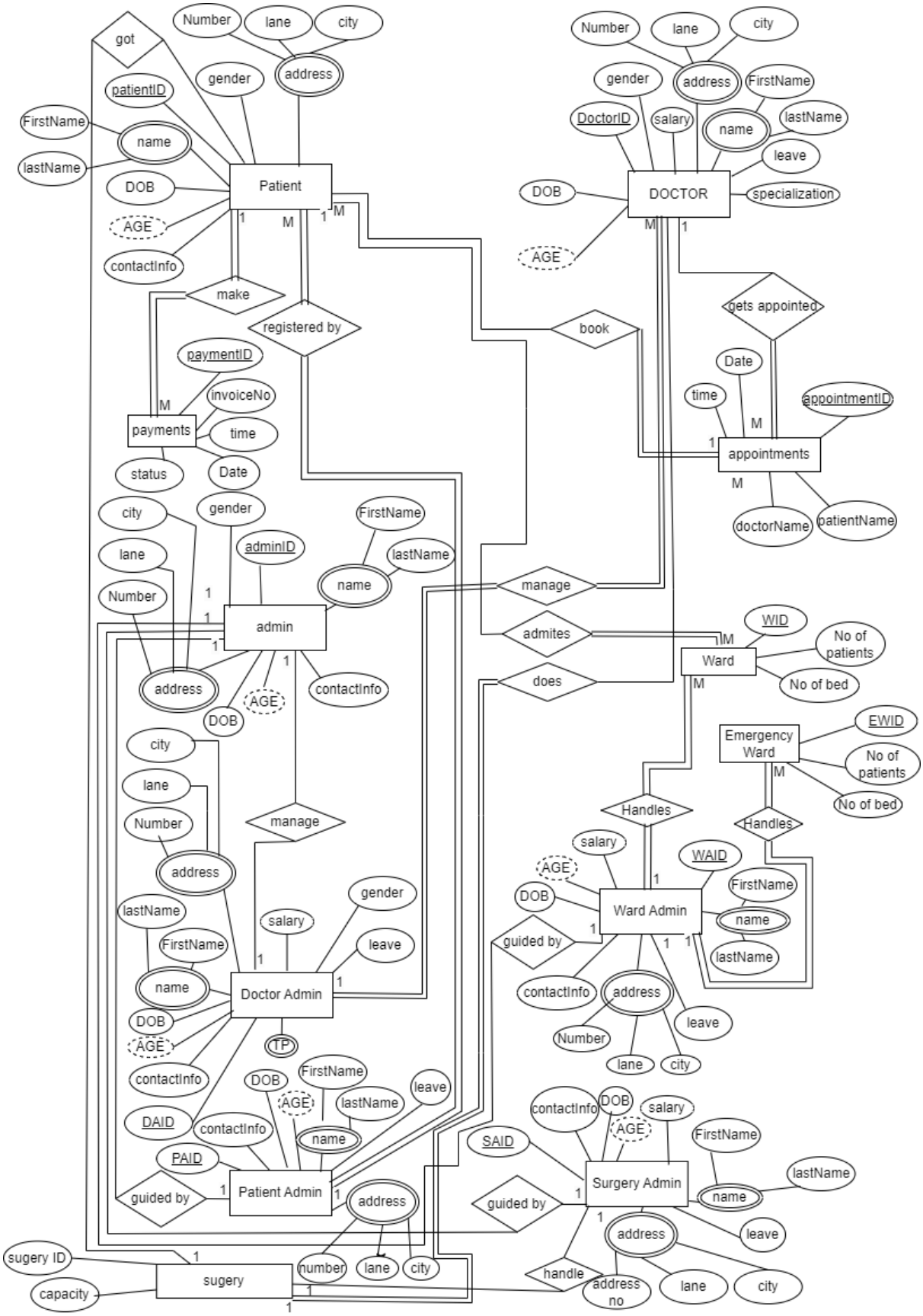
2.3.2 Non-Functional Requirements:

- **Scalability**: The above system should be able to handle many users related features.
- **Security**: Data should be protected with encryption to follow a secure detail and with some payment procedure.
- **Performance**: The system must handle the features without any delay but smoothly during the peak hours in Hospital.
- **Usability**: Following system must have an interface to integrate with server to navigate efficiently.
- **Availability**: The system should ensure high availability, especially for time-sensitive operations like surgery and emergency appointments.

3. Chapter 03 – Design

3.1 Database Design

i. ER Diagram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Ward
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Emergency Ward
EWID
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salary
AGE
WAID
DOB
Ward Admin
FirstName
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lastName
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contactInfo
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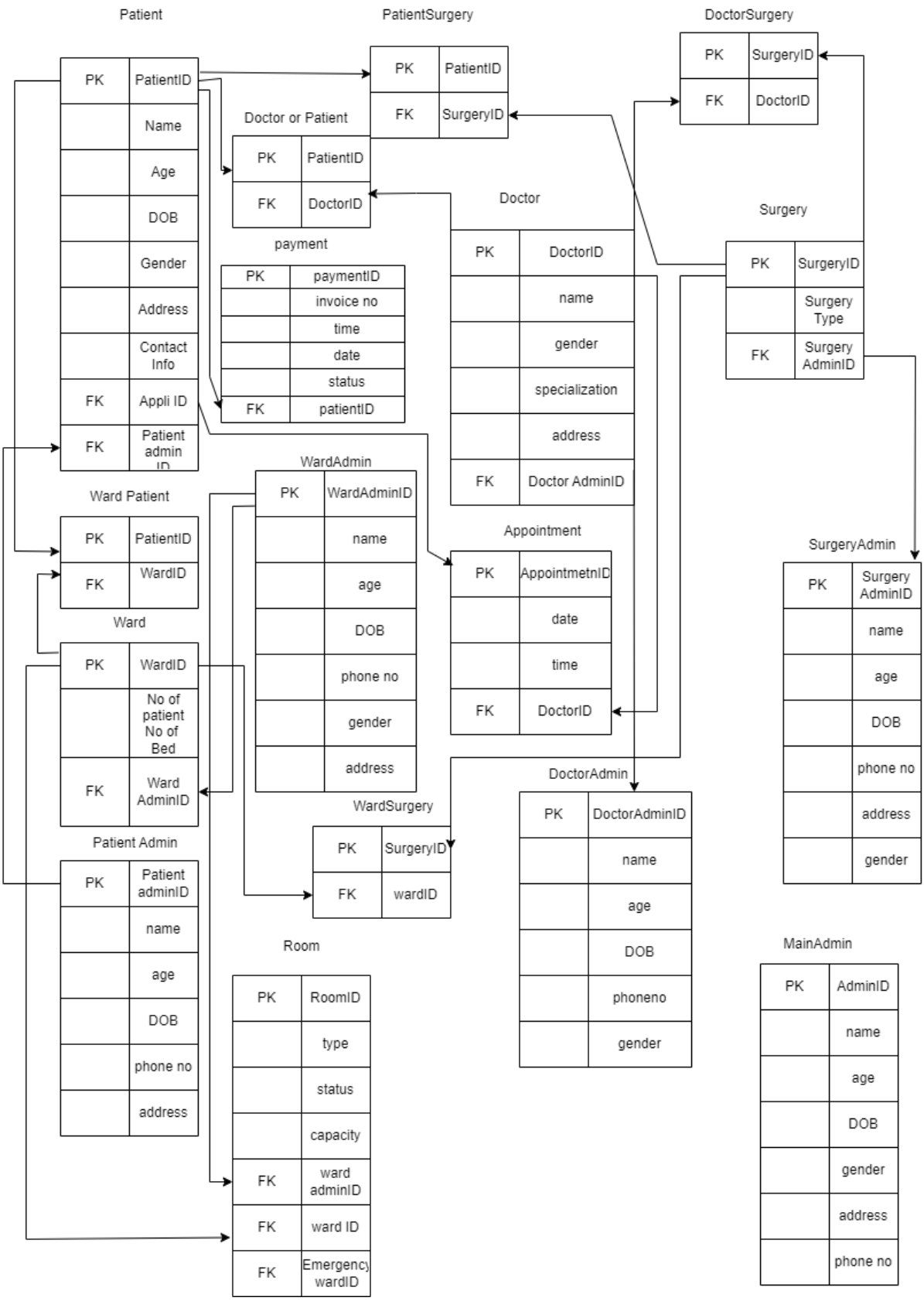
ii. Relational Schema



3.2 Database Tables and Relationships

Table: 01

Table Name: appointment

Primary Key:appointment_id

Field Name	Data Type	Size
appointment_id	Number	-
name	Varchar2	100
email	Varchar2	100
date	date	-
session	Varchar2	50
doctor_id	int	100

Table: 02

Table Name: doctor

Primary Key: doctor_id

Field Name	Data Type	Size
doctor_id	Number	-
name	Varchar2	100
gender	Varchar2	100
specialization	date	-
address	Varchar2	255
doctor_admin_id	int	-

Table: 03

Table Name: doctorsurgery

Field Name	Data Type	Size
surgery_id	Number	-
doctor_id	Varchar2	-

Table: 04

Table Name: doctor_admin

Primary Key:id

Field Name	Data Type	Size
id	Number	-
name	Varchar2	100
age	Number	100
date_of_birth	date	-
gender	Varchar2	15
addreess	Varchar2	255
phone_Number	Number	
Superadmin_id	Number	

Table: 05

Table Name: emergencysurgery

Field Name	Data Type	Size
surgery_id	Number	-
emergency_ward_id	Number	-

Table: 06

Table Name: patient

Primary Key:patient_id

Field Name	Data Type	Size
patient_id	Number	-
name	Varchar2	100
age	Number	-
date_of_birth	date	-
gender	Varchar2	50
address	Varchar2	255
Contact_info	Number	-
appointment_id	Number	-
patient_admin_id	Number	-

Table: 07

Table Name: patientsurgery

Field Name	Data Type	Size
surgery_id	Number	-
patient_id	Number	-

Table: 08

Table Name: patientward

Field Name	Data Type	Size
ward_id	Number	-
patient_id	Number	-

Table: 09

Table Name: patient_admin

Primary Key:id

Field Name	Data Type	Size
id	Number	-
name	Varchar2	100
age	Number	-
date_of_birth	date	-
gender	Varchar2	15
address	Varchar2	255
phone_number	Number	-
Superadmin_id	Number	-

Table: 10

Table Name: room

Primary Key: room_Id

Field Name	Data Type	Size
room_id	Number	-
type	Varchar2	50
status	Varchar2	50
capacity	Number	-
ward_admin_id	Number	-
ward_id	Number	-
emergency_ward_id	Number	-

Table: 11

Table Name: surgery_admin

Primary Key: id

Field Name	Data Type	Size
id	Number	-
name	Varchar2	100
age	Number	-
date_of_birth	date	-
gender	Varchar2	15
address	Varchar2	255
phone_number	Number	-
superadmin_id	Number	-

Table: 12

Table Name: super_admin

Primary Key: admin_id

Field Name	Data Type	Size
admin_id	Number	-
name	Varchar2	100
age	Number	-
date_of_birth	date	-
gender	Varchar2	100
address	Varchar2	100
phone_number	Number	-

Table: 13

Table Name: surgery

Primary Key: surgery_id

Field Name	Data Type	Size
surgery_id	Number	-
surgery_type	Varchar2	100
date	date	-
surgery_admin_id	Number	-

Table: 14

Table Name: ward

Primary Key: ward_id

Field Name	Data Type	Size
ward_id	Number	-
no_of_patients	Number	-
no_of_beds	Number	-
ward_admin_id	Number	-

Table: 15

Table Name: wardsurgery

Primary Key: surgery_id

Field Name	Data Type	Size
surgery_id	Number	-
ward_id	Number	-

Table: 16

Table Name: ward_admin

Primary Key: id

Field Name	Data Type	Size
id	Number	-
name	Varchar2	100
age	Number	-
date_of_birth	date	-
gender	Varchar2	15
address	Varchar2	255
phone_number	Number	-
superadmin_id	Number	-

Visualizing the Relationships:

- Main Admin (1) ➔ Ward Admin (Many)
- Main Admin (1) ➔ Surgery Admin (Many)
- Main Admin (1) ➔ Doctor Admin (Many)
- Main Admin (1) ➔ Patient Admin (Many)
- Ward Admin (1) ➔ Ward (Many)
- Ward (1) ➔ Room (Many)
- Ward (1) ➔ Bed (Many)
- Surgery Admin (1) ➔ Surgery (Many)
- Surgery (1) ➔ Patient (Many)
- Doctor Admin (1) ➔ Doctor (Many)
- Doctor (1) ➔ Appointments (Many)
- Room (1) ➔ Appointments (Many)

Chapter 04 – Administrative and Storage

4.1 Database Administrator (DBA)

Database Administrator is responsible for overall management, maintenance and optimization of databases. In context to Hospital Management System the DBA ensures that some features related to the Hospital Management System should be check if it is running securely, efficiently and reliably.

DBA plays vital role in database management for like data availability, integrity and security and the performance which also provides best health care facilities.

- ✓ **Database Design and Implementation** – design database architecture to meet the requirements.
- ✓ **Database Security and Access Control** – Protect sensitive data from unauthorized access.
- ✓ **Performance Monitoring and Optimization** – Ensuring that database performs efficiently during processing.
- ✓ **Backup and Recovery** – Data protection from unauthorized through regular backups and retain the data whenever need.
- ✓ **Database Maintenance** – Keep the database up to date for security concerns.
- ✓ **Data Integrity and Consistency** – Ensures that data processed and stored in a table should be consistent.
- ✓ **User support and Troubleshooting** – solving any issues related to Database Management System.
- ✓ Compliance with regulatory standards – Database should be legal.
- ✓ **Disaster Recovery** – Availability of database and plan for recovery.
- ✓ **Capacity Plan** – Database scale increasing in future.
- ✓ **Data Migration and integration** – Manages data migration and integration with the Hospital System.
- ✓ **Database auditing and reporting** – Maintain and generate reports and keep on track about the performance and security for auditing purposes.

4.2 Backup Plan

- ✓ Ensure the availability and integrity of data.
- ✓ Minimize and restore normal operations in case of data loss, breakdown etc.
- ✓ Maintain compliance with data regulations.
- ✓ Protect against the accidental deletion of any records.

Backup Types

- ✓ Full Backup – a complete backup of all data.
- ✓ Differential Backup – Daily backup of to keep recording all the changes made to the database.
- ✓ Incremental Backup – Multiple times per day backup with the time of 4 hours.

Storage of Backup

- ✓ On-site Backup – Fast recovery in case of any failure.
- ✓ Off-site Backup – Provides protection against disaster.
- ✓ Offline Backup – Backup to cloud or any external devices to keep it.

Disaster Recovery

- ✓ Access the extent of data loss.
- ✓ Restore from latest backup.
- ✓ Verify restored data.
- ✓ Resume Normal Operations

Security Measures for Backup

- ✓ Encryption – All the data must be save to cloud to prevent from unauthorized access.
- ✓ Access Controls – only authorized users can access.
- ✓ Backup Logs - Maintaining all the records of backup and keep auditing.

4.3 Cloud-Database Plan

Cloud based plan is a strategy for using cloud-based database to store data, manage and secure the data from unauthorized access.

- ✓ Scalability – Handling large amount of data.
- ✓ Availability – Remains 24/7 for any need.
- ✓ Security – Protect sensitive data from unauthorize access.
- ✓ Disaster Recovery – Regular backup and can be restored efficiently.
- ✓ Cost efficiency – reduce cost while maintaining performance.

Chapter 05 – Conclusion

In conclusion, we can say that hospital management system got some features through the requirement that we gather from the client. Make these requirements into the design and later we convert this logical design into physical design to meet the client requirements. So that the client will be efficiently can relate some features all the data must be saved to the database with secure into the cloud and make it available all the times whenever client request a service.

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