



# DAYANANDA SAGAR COLLEGE OF ENGINEERING

AN AUTONOMOUS INSTITUTE AFFILIATED TO VTU, APPROVED BY AICTE & UGC, ACCREDITED BY NAAC WITH 'A' GRADE.

AUTOMOBILE ENGINEERING, BIOTECHNOLOGY, COMPUTER SCIENCE & ENGINEERING, ELECTRICAL & ELECTRONICS ENGINEERING, ELECTRONICS & INSTRUMENTATION ENGINEERING, ELECTRONICS & TELECOMMUNICATION ENGINEERING, INDUSTRIAL ENGINEERING & MANAGEMENT, MEDICAL ELECTRONICS AND MECHANICAL ENGINEERING ACCREDITED BY NBA

## DEPARTMENT OF MEDICAL ELECTRONICS

**Project title: CardioHealth**

**Project Guide: Prof. Sahana M Kulkarni**

STUDENT NAME	USN
DEEKSHA V	1DS15ML006
FIHA AFRA	1DS15ML009
PRATHIBHA K P	1DS15ML023
SYED FIZA	1DS15ML032



# CardioHealth

**Home Based Rehabilitation System for People with  
Cardiovascular Diseases**

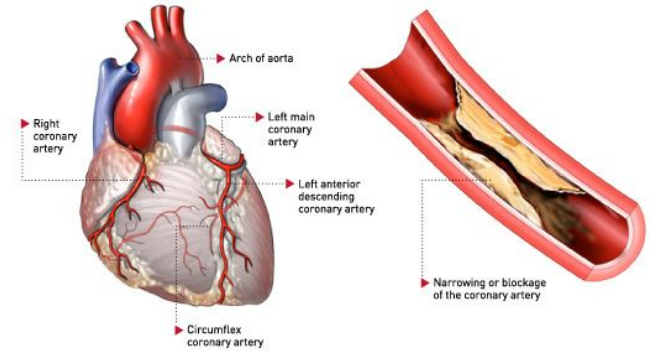
# Cardiovascular Diseases

- Coronary Artery Disease (CAD)
- Heart attack
- Heart failure
- Angioplasty
- Heart surgery

They can be managed in 2 ways:

1. Conservative Method
2. Surgical Management

Anyone under conservative or surgical method both are eligible for cardiac rehabilitation.



# Cardiac Rehabilitation

- Exercise is actually a key part of managing cardiovascular disease
- Cardiac rehabilitation is a medically supervised program that involves exercise and other components to help improve heart health after a person had surgery, or suffers a heart attack or other significant cardiac event
- Cardiac rehabilitation programs generally span three months, with sessions two or three times a week (usually 36 sessions over a 12-week time-period)

# Phases of cardiac rehab

Cardiac rehab - 4 phases

**Phase 1 - Early rehab. Upto 10 days restricted to hospital stay.**

**Phase 2 - Monitored rehab. 10 days to 3 months. Under the physiotherapist.**

**Phase 3 - Not monitored. 3 months to 1 year. Visit once a month for assessment and advice.**

**Phase 4 - Lifelong management. To avoid reversibility.**

- **Cardiac parameter - heart rate (pulse rate calculated from heart rate)**

Individually tailored exercise - MIDF

**Mode**

**Intensity**

**Duration**

**Frequency**

As consulted by cardiologist and physiotherapist

## **Affordability/ Current facilities**

- Rehab facilities - Focused in A grade hospitals
- Inconvenience to travel to the specific centers
- Targeted for upper class / Business oriented
- Monitoring multiple patients/slots

## **The Problem**

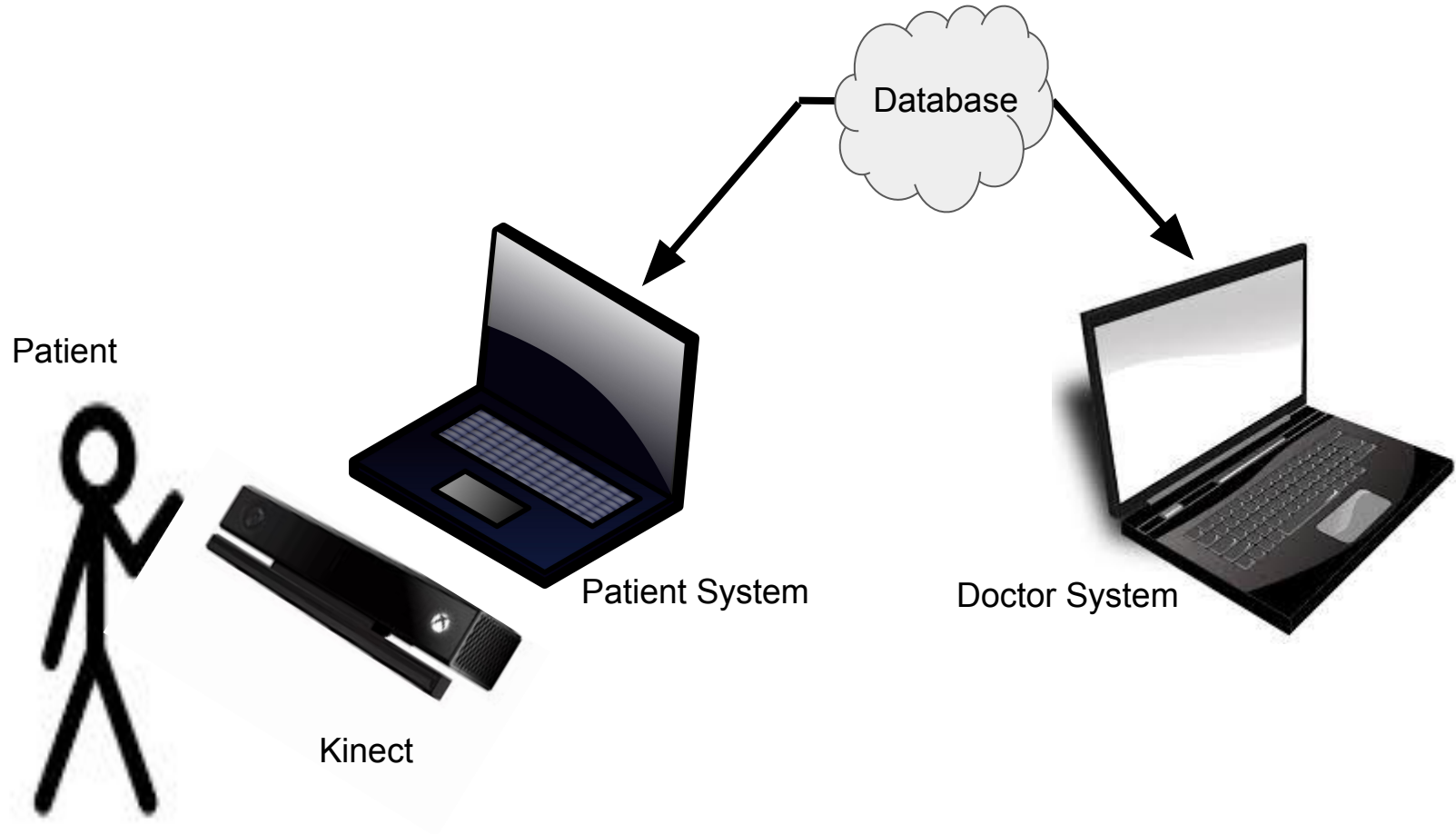
- Frequent visits are required
- Time consuming
- Expensive
- Difficulty in communicating with the practitioner about the progress
- Lose motivation
- Skipped sessions

## **Solution**

**Home based system allows patient doctor interaction.**

## **Concerns about home based system**

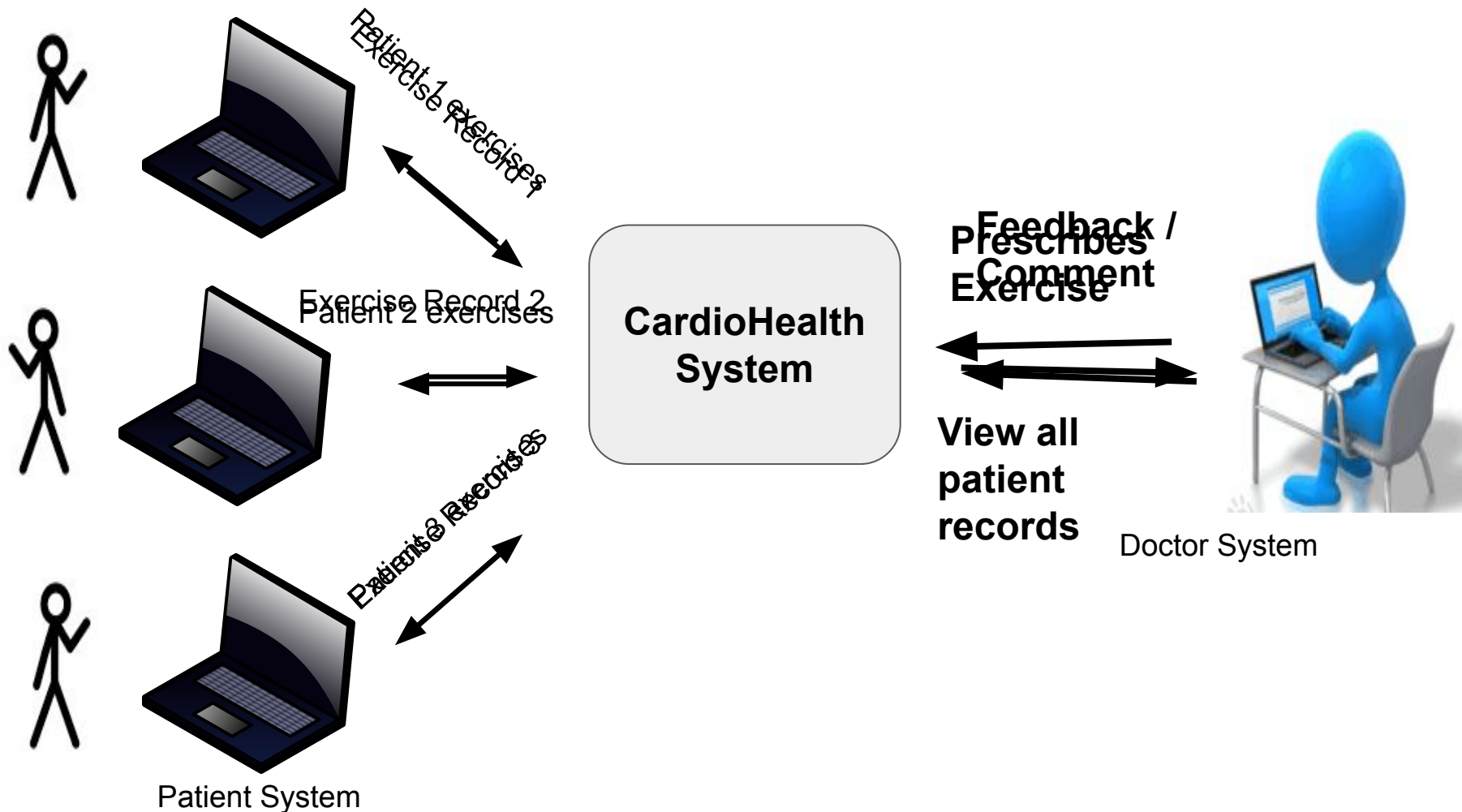
- **Which set of exercises to perform**
- **Number of repetitions per session**
- **Not sure if the postures are correct**
- **Maintain required range of heart rate**

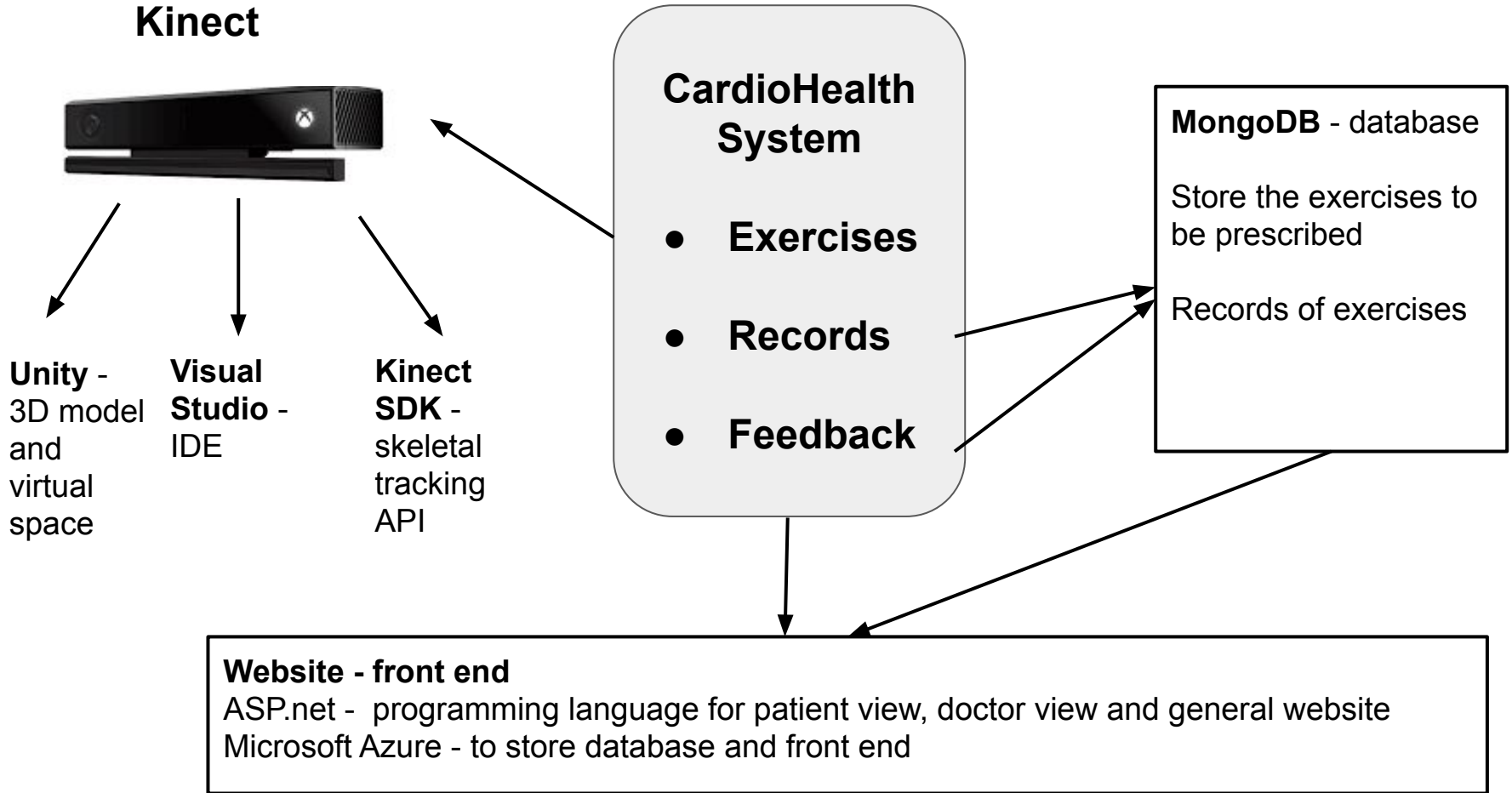


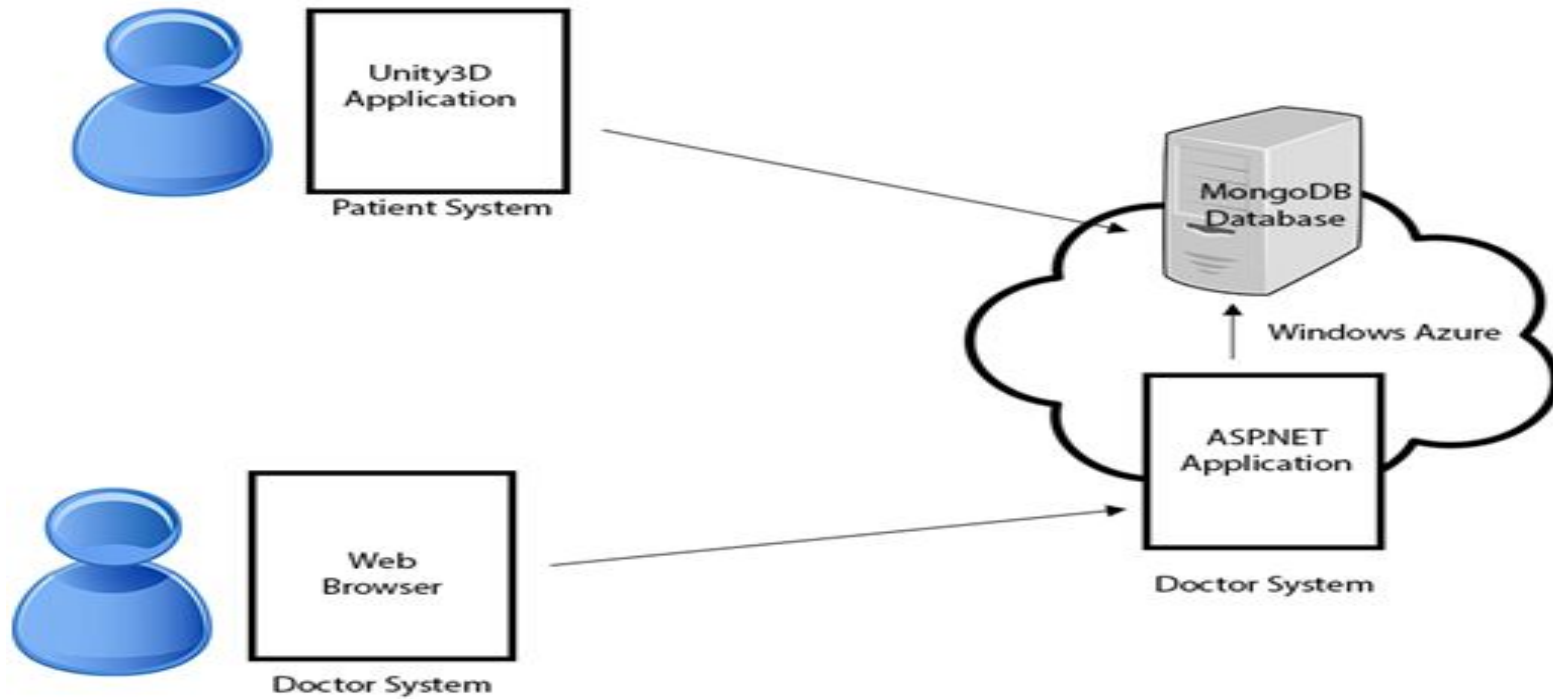


# System Overview

- CardioHealth is a home-based rehabilitation system for patients in rehabilitation of cardiovascular diseases with a user-friendly interface and also a doctor-patient interaction system for doctors/physiotherapists to diagnose and examine patients without face-to-face interaction
- CardioHealth utilizes the Kinect V2, patients must perform exercises in front of the Kinect and results are sent straight to the patient's Doctor/Physiotherapist
- CardioHealth uses heart rate estimation to determine the patient's heart rate through exercises

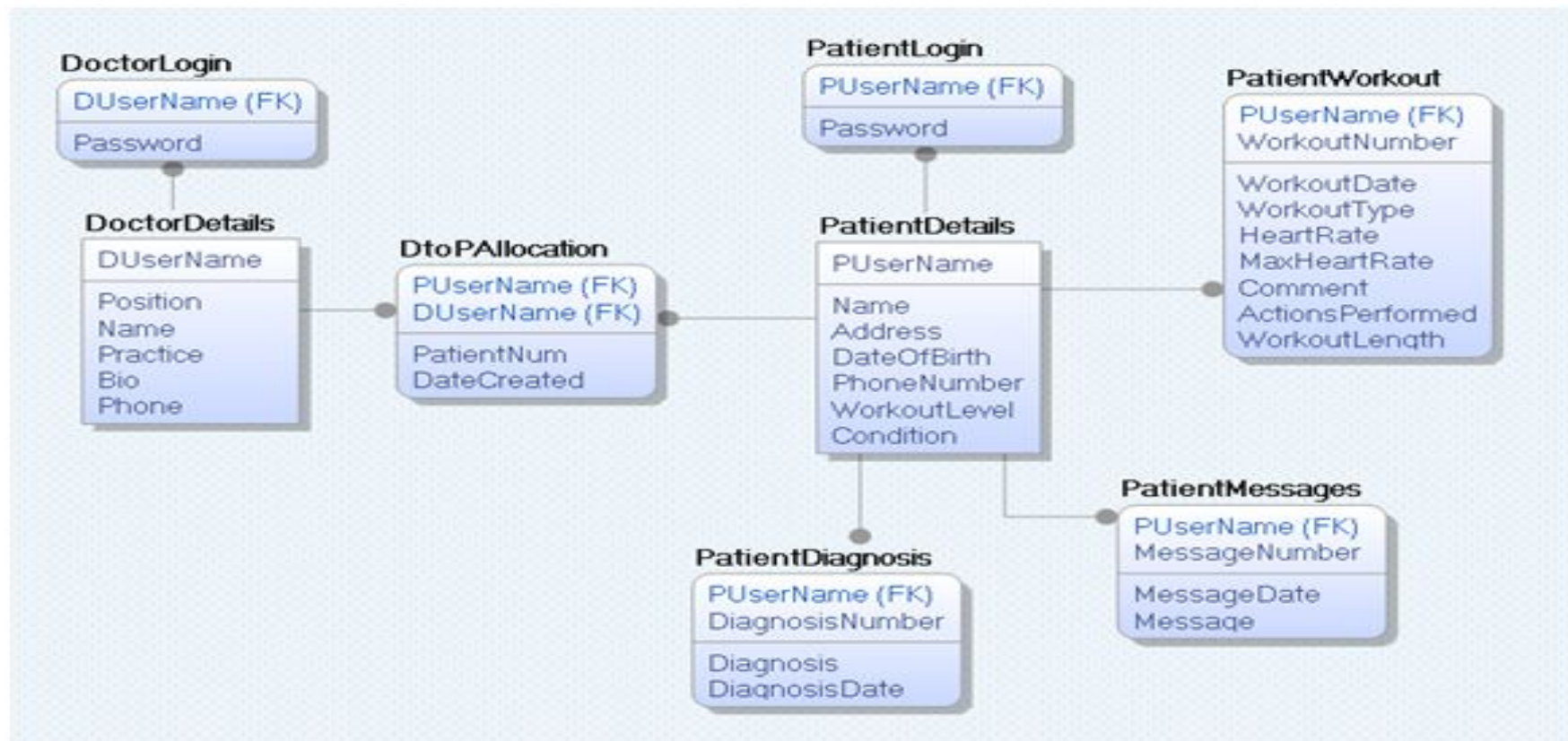






**System Architecture diagram**

# Database



# EXPECTED OUTCOMES

- To establish a customized plan to help the patient to regain strength
- To prevent the condition from worsening and reduce the risk of future heart problems
- To get regular feedback and updates on the exercises
- To improve the patient health and quality of life

