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Dream Dental

**Database System Build**

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**Information Technology Studies**

**Fundamentals of Data Models and Databases**

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# Executive Summary:

The purpose of this report is to design and build a modern database system based on the analysis of local dental practice ‘Dream Dental’. This report will involve completing the systems design, and subsequently implementing the resulting business entities, processes and functional hierarchy to build the database system using SQL Server. The following analysis uses the current, paper based administrative processes, business units, methods of delivery, and current employee structure to provide the framework for a digital and scalable database system which would be user friendly and reliable with the ability to be easily updated and maintained.

## Systems Design – Initial planning:

***Company situation:***

Family Dental practice, Est. 25 years ago. Small scale local business with 5 Employees (3 Dentists, 1 Receptionist and 1 Hygienist). The current system is run by the filling out of 4 individual forms depending on the requirement i.e. Customer appointment, Dentist required, Tool required, or Procedure required.

This system is potentially slow and laborious, particularly for the tasks of retrieving and updating information where required.

***Problems and constraints:***

Traditionally run on a paper-based system to process booking of appointments and scheduling of procedures, no information on the state of potential databases that exist if any. Possibility for missing records or misplaced information.

Large scale of paperwork to collate information into databases, potential for disorganisation.

***Objectives:***

Analyse the CRUD Matrix process, based on the FHD and ERD and SQL Server to create a working system with relevant user-friendly databases to simplify and secure the current model.

***Scope & Boundaries:***

This project will be a local network database for direct operations, all else is out of scope. Solution will be delivered to John for use.

## Models:

Using the information provided and a list of reasonably deduced assumptions models have been created to conceptualise the, entities and functional hierarchy (Described in more detail below).

***SQL Server:***

An SQL script modelled on the following ERD & FHD has been provided to be run for the Dream dental database. This includes two entries per table and a select statement that provides information from multiple tables, it has been presented to copy and paste into Microsoft SQL server.

***CRUD Matrix Diagram:***

To display the operation of business, function a Create, Retrieve, Update, Delete (CRUD) diagram has been provided. This displays the actions and interactions between entities, business processes and databases.

***Entity Relationship Diagram (ERD):***

A single entity relationship diagram has been created to represent the entities that influence the SQL, i.e. the Customers (Patients), Employees (Dentists), procedures and appointments. The ERD shows entities, their components as relating to database requirements and relationships with one another to allow for a system of categorisation and cross reference.

***Functional Hierarchy Diagram (FHD):***

This diagram has been created to show the logical flow of tasks from the starting point to the defining processes. Unlike the BPM, this diagram shows a branching hierarchy of tasks that either act as decision points or interact directly with the databases.

# Appendix 1 || CRUD Matrix

A screenshot of a cell phone

Description generated with very high confidence

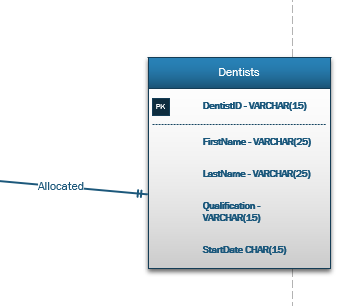
# **Appendix 2 ||** Updated ERD with values

Also, can be seen in SQL code.

A screenshot of a social media post

Description generated with very high confidenceA screenshot of a cell phone

Description generated with very high confidence



A screenshot of a social media post

Description generated with very high confidence

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# Appendix 3 || SQL Code

CREATE DATABASE DreamDental;

USE DreamDental;

CREATE TABLE Patients

(

Patient\_ID VARCHAR(15)

PRIMARY KEY NOT NULL,

Patient\_LastName VARCHAR(25) NOT NULL,

Patient\_FirstName VARCHAR(25) NOT NULL,

Patient\_St VARCHAR(35) NOT NULL,

Patient\_Suburb VARCHAR(25) NOT NULL,

Patient\_City VARCHAR(20) NOT NULL,

Patient\_Phone INT NOT NULL,

Patient\_DOB DATE NOT NULL

);

CREATE TABLE Dentist

(

Dentist\_ID VARCHAR(15)

PRIMARY KEY NOT NULL,

Dentist\_LastName VARCHAR(25) NOT NULL,

Dentist\_FirstName VARCHAR(25) NOT NULL,

Dentist\_Qualification VARCHAR(15) NOT NULL,

Dentist\_StartDate CHAR(15) NOT NULL

);

CREATE TABLE Appointments

(

Appointment\_ID VARCHAR(15)

PRIMARY KEY NOT NULL,

Appointment\_Time SMALLDATETIME NOT NULL,

Appointment\_Reason VARCHAR(25) NOT NULL,

Patient\_ID VARCHAR(15) NOT NULL,

CONSTRAINT FK\_Appointments\_Patients

FOREIGN KEY (Patient\_ID)

REFERENCES Patients,

Dentist\_ID VARCHAR(15) NOT NULL

CONSTRAINT FK\_Appointments\_Dentist

FOREIGN KEY (Dentist\_ID)

REFERENCES Dentist

);

CREATE TABLE Instruments

(

Instrument\_ID VARCHAR(15)

PRIMARY KEY NOT NULL,

Instrument\_Name VARCHAR(15) NOT NULL,

Instrument\_Cost DECIMAL(7,2) NOT NULL,

Instrument\_PurchaseDate DATE NOT NULL,

);

CREATE TABLE DProcedure

(

DProcedure\_ID VARCHAR(15)

PRIMARY KEY NOT NULL,

DProcedure\_Name VARCHAR(15) NOT NULL,

Appointment\_ID VARCHAR(15) NOT NULL

CONSTRAINT FK\_Dprocedure\_Appointments

FOREIGN KEY (Appointment\_ID)

REFERENCES Appointments,

Instrument\_ID VARCHAR(15) NOT NULL

CONSTRAINT FK\_Dprocedure\_Instruments

FOREIGN KEY (Instrument\_ID)

REFERENCES Instruments

);

INSERT INTO Patients (Patient\_ID, Patient\_LastName, Patient\_FirstName, Patient\_St, Patient\_Suburb, Patient\_City, Patient\_Phone, Patient\_DOB)

VALUES ('P001', 'Stephens', 'Barry', 'Randwick Rd', 'Moera', 'Wellington', '0221345654', '05/05/1985');

INSERT INTO Patients (Patient\_ID, Patient\_LastName, Patient\_FirstName, Patient\_St, Patient\_Suburb, Patient\_City, Patient\_Phone, Patient\_DOB)

VALUES ('P002', 'Jones', 'Robert', 'View Tce', 'Henderson', 'Auckland', '0211943001', '05/01/1941');

INSERT INTO Dentist (Dentist\_ID, Dentist\_LastName, Dentist\_FirstName, Dentist\_Qualification, Dentist\_StartDate)

VALUES ('DR080', 'Jansen', 'Thomas', 'DDS','01/01/1998');

INSERT INTO Dentist (Dentist\_ID, Dentist\_LastName, Dentist\_FirstName, Dentist\_Qualification, Dentist\_StartDate)

VALUES ('DR081', 'Hosking', 'Suzanne', 'BDS','05/08/2004');

INSERT INTO Appointments (Appointment\_ID, Appointment\_Time, Appointment\_Reason, Patient\_ID, Dentist\_ID)

VALUES ('APP01', '11/10/2018 10:30:00 AM', 'Filling', 'P001','DR080');

INSERT INTO Appointments (Appointment\_ID, Appointment\_Time, Appointment\_Reason, Patient\_ID, Dentist\_ID)

VALUES ('APP02', '11/10/2018 01:45:00 PM', 'Root Canal', 'P002','DR081');

INSERT INTO Instruments (Instrument\_ID, Instrument\_Name, Instrument\_Cost, Instrument\_PurchaseDate)

VALUES ('INS01', 'Milling Machine', '899.00', '02/08/2012');

INSERT INTO Instruments (Instrument\_ID, Instrument\_Name, Instrument\_Cost, Instrument\_PurchaseDate)

VALUES ('INS02', 'Telescope', '645.00', '01/09/2014');

INSERT INTO DProcedure (DProcedure\_ID, DProcedure\_Name, Appointment\_ID, Instrument\_ID)

VALUES ('PR001', 'Root Canal', 'APP01', 'INS01');

INSERT INTO DProcedure (DProcedure\_ID, DProcedure\_Name, Appointment\_ID, Instrument\_ID)

VALUES ('PR002', 'Checkup', 'APP02', 'INS02');

SELECT Patients.Patient\_ID, Patient\_FirstName, Patient\_LastName, Appointment\_Time, Appointment\_Reason, Dentist.Dentist\_LastName

FROM Patients

INNER JOIN Appointments

ON Patients.Patient\_ID = Appointments.Patient\_ID

INNER JOIN Dentist

ON Appointments.Dentist\_ID = Dentist.Dentist\_ID

## List of Assumptions:

None.

## Unresolved Questions:

None.