Dream Dental
Database Specification report

Prepared by:

Blake Larson – **21200205**

Dalvir Singh – **21801212**

Vrajesh Choksi – **21801861**

Program Tutor's:

Adrian Hargreaves **&** Dr Marta Vos.

Information Technology Studies
Fundamentals of Data Models and Databases

Contents:

Executive Summary:

This report was prepared to analyse a local dental practice and model the current system data requirements to transfer a paper-based system of administration to a modern computer-based system.

The following analysis uses the current processes, business units, methods of delivery, administrative procedures and current employee structure to provide the framework for a digital and saleable database system that is 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 current business process, entities and functional hierarchy 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 Gina for use.

Models:

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

Business Process Models (BPM):
Two individual process models have been created for the main business processes described: 'Booking an appointment' and 'Scheduling a procedure'. These have been created to show the Receptionist-Patient interaction and the subsequent steps that result is an appointment being added to the database. Secondly, another BPM has been created to show the process of the Dentist then referencing the information recorded by the Receptionist and the resulting process that occurs during the scheduling procedure.

Entity Relationship Diagram (ERD):
A single entity relationship diagram has been created to represent the entities that influence the business processes, 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.

Diagrams use the following key:
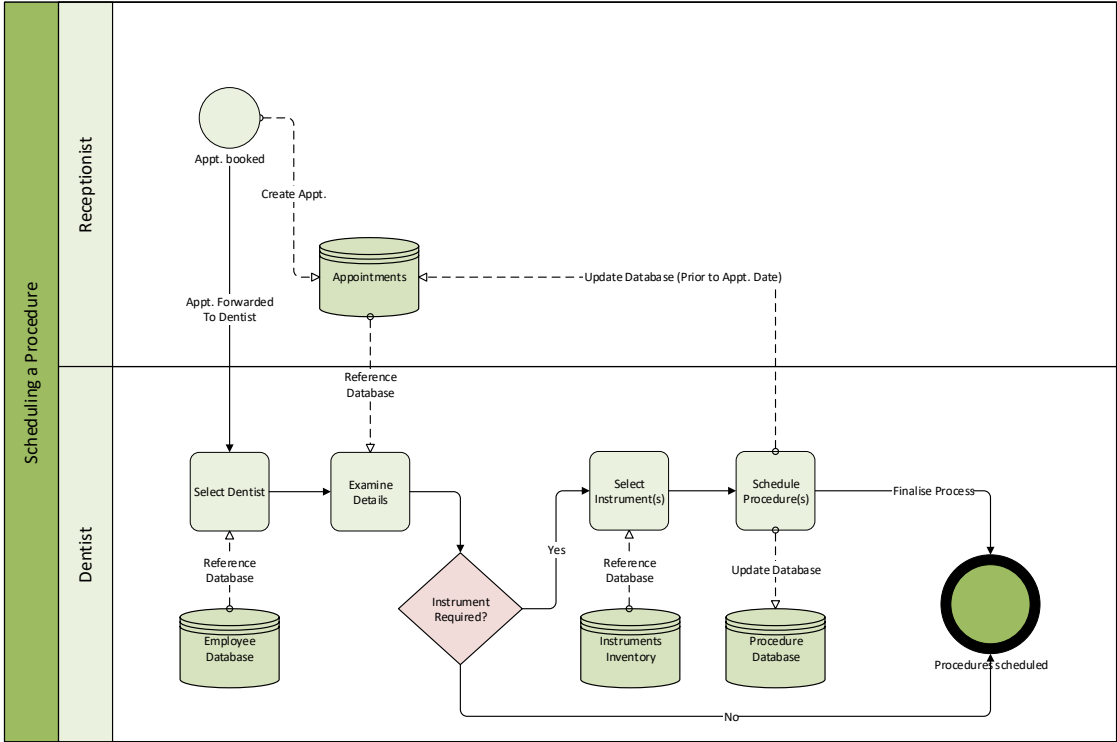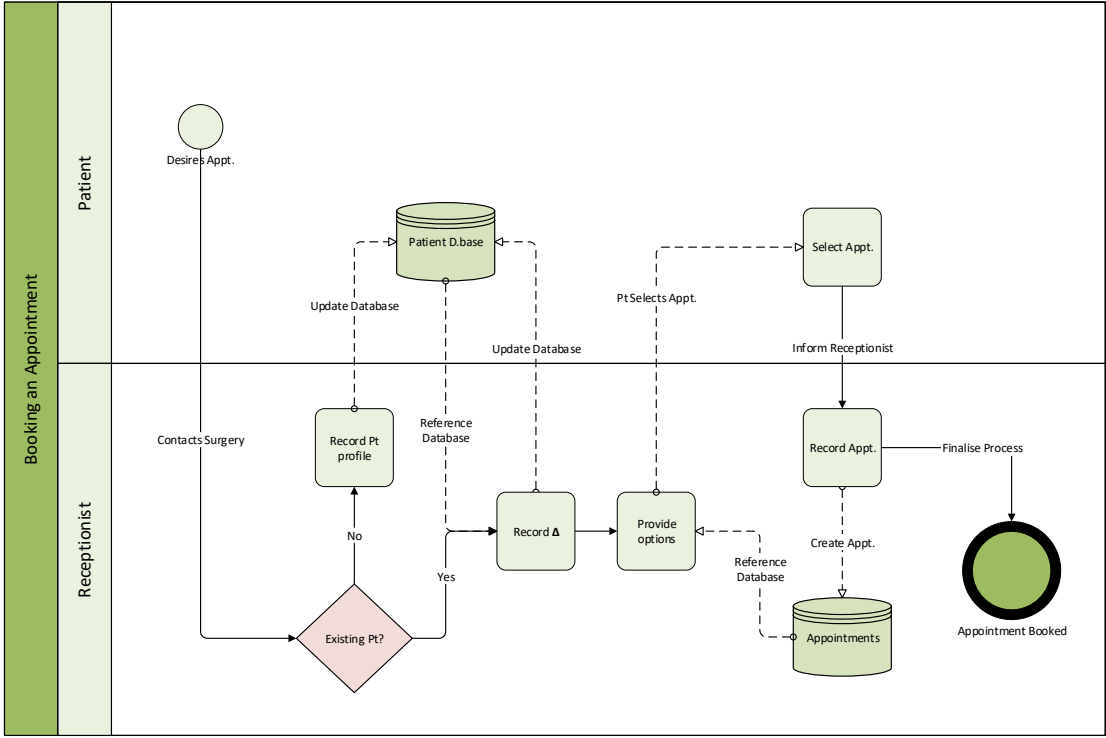
APPT: Appointment
PT: Patient
INS: Instrument
DR: Dentist
PR: Procedure

Appendix 1 || Business Process Models:

Booking an Appointment

Patient / Receptionist swimlane

- Desires Appt.
- Contacts Surgery
- Existing Pt?
  - No → Record Pt profile → Update Database → Patient D.base
  - Yes → Record Δ
- Record Δ → Provide options (Reference Database)
- Pt Selects Appt. → Select Appt. → Inform Receptionist
- Record Appt. → Create Appt. → Appointments (Reference Database)
- Finalise Process → Appointment Booked

Scheduling a Procedure

Receptionist / Dentist swimlane

- Appt. booked → Create Appt. → Appointments
- Appt. Forwarded To Dentist → Select Dentist (Reference Database → Employee Database)
- Examine Details (Reference Database)
- Instrument Required?
  - Yes → Select Instrument(s) (Reference Database → Instruments Inventory) → Schedule Procedure(s)
  - No → Schedule Procedure(s)
- Schedule Procedure(s) → Update Database → Procedure Database
- Update Database (Prior to Appt. Date) → Appointments
- Finalise Process → Procedure scheduled

Appendix 2 || Entity Relationship Diagram:

Patient

PK	PT_ID

PT_NAME

PT_ADDRESS

PT_DOB

PT_NUMBER

Instrument

PK	INS_ID

INS_NAME

INS_COST

INS_PURCHASE_DATE

Appointment

PK	APPT_NUMBER

FK	PT_ID
FK	DR_STAFF_ID
FK	PR_NAME

APPT_DATE

APPT_TIME

APPT_REASON

Procedure

PK	PR_NAME

FK	APPT_NUMBER
FK	DR_STAFF_ID
FK	INS_ID

Dentist

PK	DR_STAFF_ID

DR_NAME

DR_QUALIFICATION

DR_START_DATE
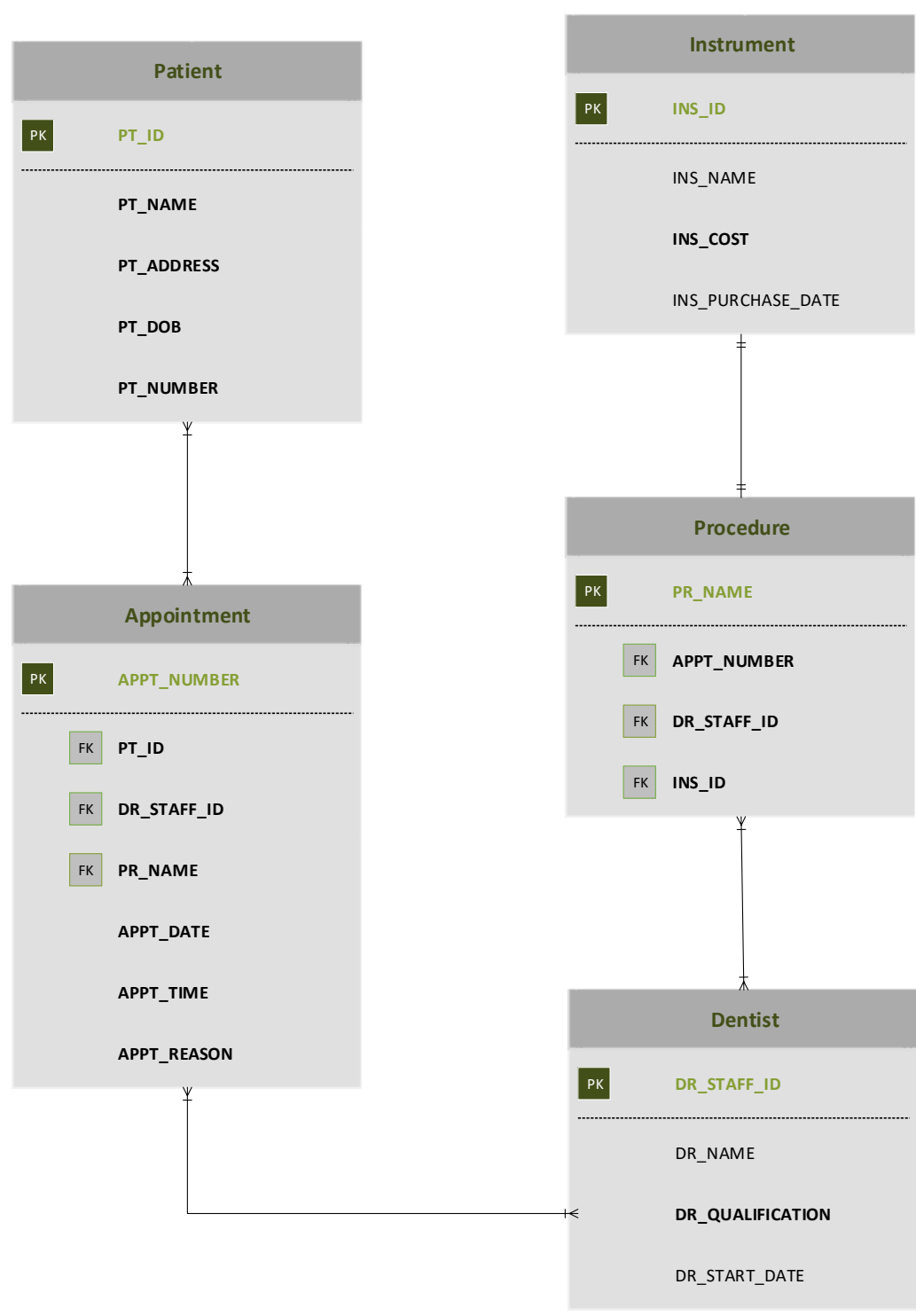
Appendix 3 || Functional Hierarchy Diagram
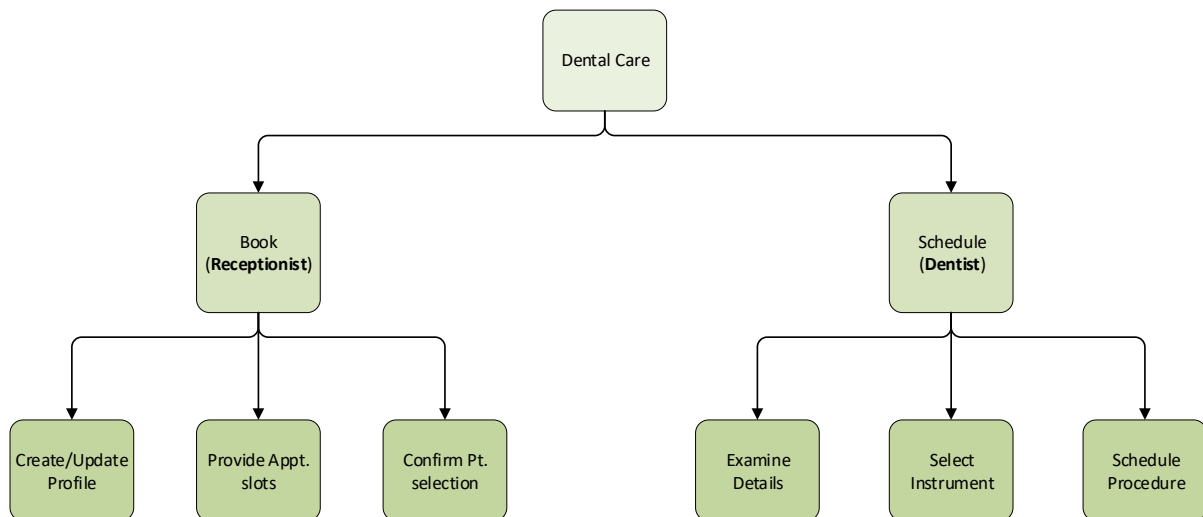
List of Assumptions:
- There may be no appointments or Patients depending on the scenario.
- There will always be one or more Dentists employed.
- A procedure may not require a specialty instrument.
- There may not be any appointments booked at a given time.
- A procedure is seen as a separate entity having a 1:1 relationship with required instrument.
- The 1:M relationship is used for patients and appointments as they may have may over a given period of time.

Unresolved Questions:
- If the instrument purchase date is in relation to the purposes of calibration do, we require a separate stock auditing process/database for this?
- Would it simplify the process to have the Dental hygienist determine if the appointment is only related to a check-up and therefore not require any specialist equipment?