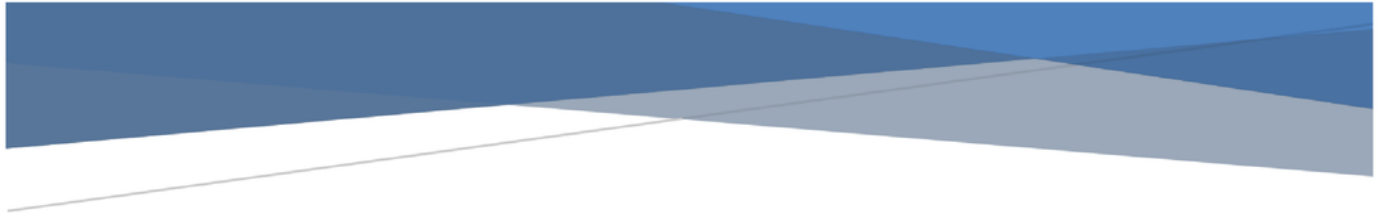


Information Engineering - Database Design

by Austin Hooper

FILE	936_AUSTIN_HOOPER_INFORMATION_ENGINEERING_- _DATABASE_DESIGN_113987_1450586964.DOCX		
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DATABASE DESIGN

LOCAL DENTAL AND ORTHODONTIC SURGERY

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Course: BSc Software Engineering
Module: Information Engineering (M4X01003)
Lecturer: Beverley Holland

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1. Introduction

This report covers the logical design of a relational database for a dental and orthodontic surgery, along with its implementation in Microsoft Access. The report shows the initial design, along with the implementation of tables, forms, reports and SQL.

Finally, this report will conclude the designing and implementation of the database, followed by references.

2. Initial Design

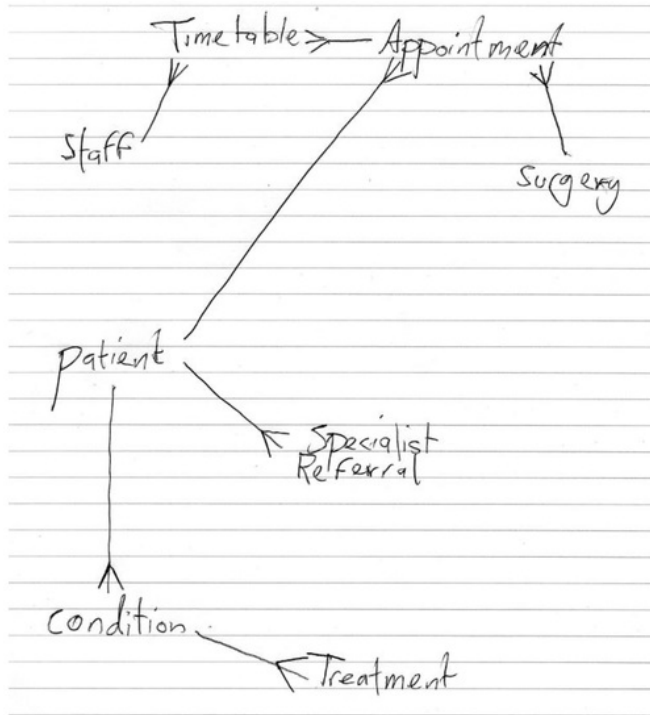


Figure 1 - Initial structure

This is the initial plan for the database structure. Note the “Timetable” table, which was included to resolve the many-to-many relationship which existed between the Staff and Appointments tables.

The Patient table links to a Condition table, which itself links to the Treatment table. The idea here is that each patient may have multiple conditions or issues, and each of those has many possible treatments.

Only one patient may be present per appointment, but as previously discussed, multiple staff may be present in one appointment.

Each patient may have many referrals to external specialists.

Finally, each of the three surgeries will have many appointments, but each appointment will only be in one surgery.

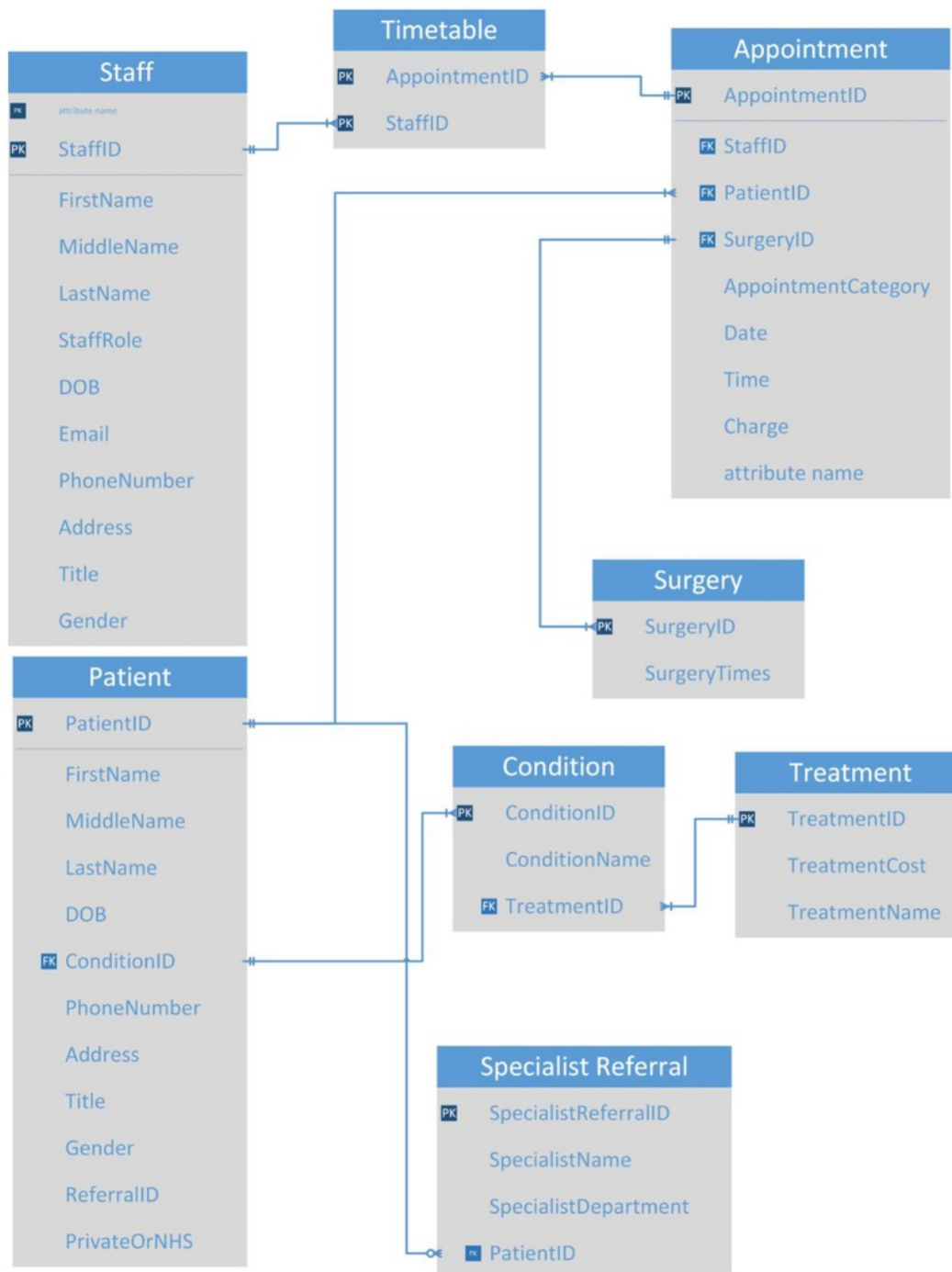


Figure 2 - Visio ERD

3. Microsoft Access Entity Relationship Diagram

See below the entity relationship diagram once tables were set up and linked in Microsoft Access. As previously noted, “tblTimetable” was included to solve the many-to-many relationship issue.

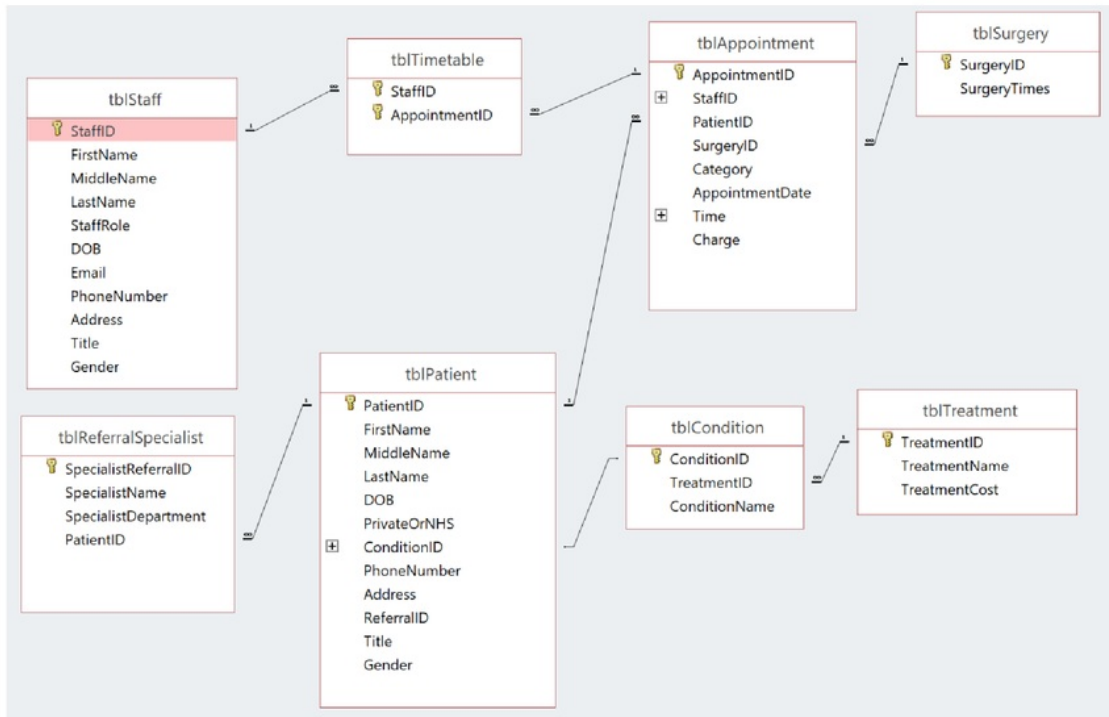


Figure 3 - Access implementation

4. Forms

The Main Menu form welcomes the user and allows them to navigate to each of the forms and reports.

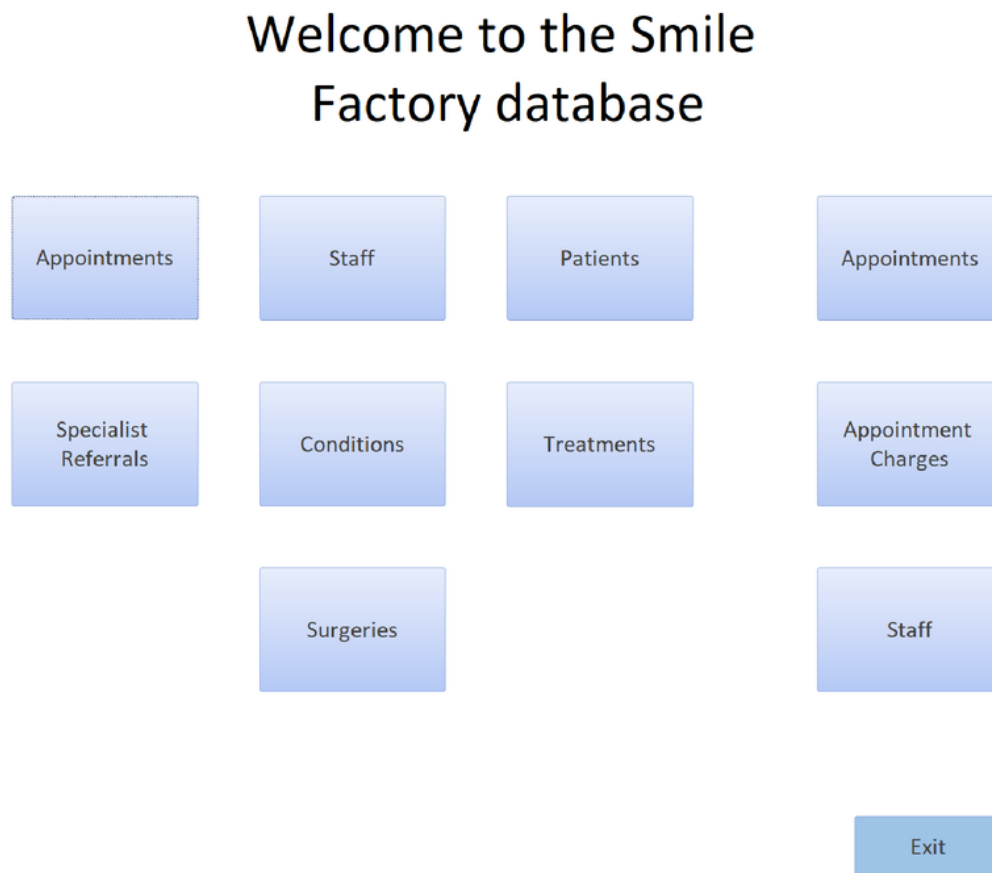


Figure 4 - Main menu

Appointment

AppointmentID
StaffID
PatientID
SurgeryID
Category
AppointmentDate
Time
Charge

< New Record Delete Record Save Record > Main Menu

Figure 5 - Appointment form

Condition

ConditionID
TreatmentID
ConditionName

< New Record Delete Record Save Record > Main Menu

Figure 6 - Condition form

Patient

PatientID	1
FirstName	Liam
MiddleName	
LastName	Salter
DOB	01/01/2018
PrivateOrNHS	NHS
ConditionID	2, 3
PhoneNumber	01792481000
Address	UWTSD, Mount Pleasant Campus, Swansea, SA1 6ED
ReferralID	2
Title	Mr
Gender	Male

Figure 7 - Patient form

Specialist Referral

SpecialistReferralID	1
SpecialistName	Dr Name One
SpecialistDepartment	Prince Philip Hospital
PatientID	1

Figure 8 - Specialist referral form

Staff

StaffID	1
FirstName	Jon
MiddleName	
LastName	Davies
StaffRole	Dentist
DOB	01/01/2018
Email	Admissions@uwtsd.ac.uk
PhoneNumber	01792481000
Address	UWTSD, Mount Pleasant Campus, Swansea, SA1 6ED
Title	Dr
Gender	Male

< New Record Delete Record Save Record >

Main Menu

Figure 9 - Staff form

Surgery

SurgeryID	1
SurgeryTimes	Morning

< New Record Delete Record Save Record >

Main Menu

Figure 10 - Surgery form

Treatment

TreatmentID	1
TreatmentName	Braces
TreatmentCost	£100.00

<

New Record

Delete Record

Save Record

>

Main Menu

Figure 11 - Treatment form

5. Reports

Staff details report:

Staff										
17 May 2018 23:50:38										
ID	Title	First name	Middle name	Last name	Staff role	Email	Phone	Address	DOB	Gender
1	Dr	Jon		Davies	Dentist	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
2	Dr	David		James	Dentist	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
3	Dr	John	Dave	Smith	Dentist	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
4	Dr	Austin		Hooper	Dentist	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
5	Mrs	Dental	Nurse	One	Nurse	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Female
6	Mr	Dental	Nurse	Two	Nurse	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
7	Mr	Dental	Nurse	Three	Nurse	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
8	Miss	Dental	Nurse	Four	Nurse	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Female
9	Mrs	Dental	Nurse	Five	Nurse	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Female
10	Mr	Dental	Nurse	Six	Nurse	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Male
11	Miss	Dental	Hygienist	One	Hygienist	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Female
12	Mrs	Dental	Hygienist	Two	Hygienist	Admissions@uwtsd.ac.uk	01792481000	UWTSO, Mount Pleasant Campus, Swansea, SA1 6ED	01/01/2018	Female
Main Menu Print										

Figure 12 - Staff details report

Appointment charges report:

This report shows details of all available appointments and the total income from them.

 Appointment Charges 17 May 2018
23:49:39

Patient ID	Charge	Patient first name	Patient last name
1	£20.00	Liam	Salter
1	£20.00	Liam	Salter
4	£20.00	Sarann	Strange
3	£20.00	Matthew	Lewington
2	£20.00	James	Millns

Total income:

Figure 13 - Appointment charges report

Details of scheduled appointments:

 Appointments 17 May 2018
23:50:06

Patient ID	Appointment ID	First name	Last name	Date	Time	Staff ID
1	1	Liam	Salter	02/02/2018	09:30 AM, 09:45 AM	2, 3
1	2	Liam	Salter	03/03/2018	10:00 AM	1, 5
4	4	Sarann	Strange	04/04/2018	10:15 AM	3, 5
3	0	Matthew	Lewington	01/01/2018	08:30 AM	4, 11
2	5	James	Millns	05/05/2018	03:15 PM	1, 11

Figure 14 - Appointments report

6. Implementation Through SQL

Due to time constraints and initial difficulties understanding SQL, the tables and relationships in the database file submitted for this assignment were not created using SQL. However, they were then created using SQL in a different file later. The SQL can be seen for this below and on the next page.

```
CREATE TABLE [tblTreatment](
TreatmentID AUTOINCREMENT,
CONSTRAINT TREATMENT_pk PRIMARY KEY (TreatmentID),
TreatmentName TEXT(40),
TreatmentCost MONEY
)

CREATE TABLE [tblCondition](
ConditionID AUTOINCREMENT,
TreatmentID INTEGER CONSTRAINT fk_Treatment_ID REFERENCES
tblTreatment (TreatmentID),
CONSTRAINT CONDITION_pk PRIMARY KEY (ConditionID),
ConditionName TEXT(40)
)

CREATE TABLE [tblPatients](
PatientID AUTOINCREMENT,
CONSTRAINT PATIENT_pk PRIMARY KEY (PatientID),
FrstName TEXT(15),
MiddleName TEXT(15),
LastName TEXT(15),
DOB DATE,
PrivateOrNHS TEXT(7),
ConditionID INTEGER CONSTRAINT fk_ConditionID REFERENCES tblCondition
(ConditionID),
PhoneNumber TEXT(11),
Address TEXT(75),
Title TEXT(5),
Gender TEXT(5)
)
```

```
CREATE TABLE [tblAppointments](
AppointmentID AUTOINCREMENT,
CONSTRAINT APPOINTMENT_pk PRIMARY KEY (AppointmentID),
StaffID INTEGER,
PatientID INTEGER CONSTRAINT fk_PatientID REFERENCES tblPatients
(PatientID),
SurgeryID INTEGER CONSTRAINT fk_SurgeryID REFERENCES tblSurgery
(SurgeryID),
Category TEXT(20),
AppointmentDate DATE,
AppointmentTime TEXT(8),
Charge MONEY
)
```

```
CREATE TABLE [tblStaff](
StaffID AUTOINCREMENT,
FirstName TEXT(15),
MiddleName TEXT(15),
LastName TEXT(15),
StaffRole TEXT(20),
DOB DATE,
Email TEXT(30),
PhoneNumber TEXT(11),
Address TEXT(75),
Title TEXT(5),
Gender TEXT(5),
CONSTRAINT STAFF_pk PRIMARY KEY (StaffID)
)
```

```
CREATE TABLE [tblSurgery](
SurgeryID AUTOINCREMENT,
CONSTRAINT SURGERY_pk PRIMARY KEY (SurgeryID),
SurgeryTimes TEXT(15)
)
```

```
CREATE TABLE [tblTimetable](
StaffID INTEGER CONSTRAINT fk_StaffID REFERENCES tblStaff (StaffID),
AppointmentID INTEGER CONSTRAINT fk_AppointmentID REFERENCES
tblAppointments (AppointmentID)
)
```

7. User Guide

On opening the database, the main menu page is displayed. The buttons on the left can be used to access forms, and buttons on the right to access reports. The exit button will close Microsoft Access.

Each of the forms can be used to scroll through data for each table. The forms allow the user to add new records to the table, delete, or modify and save existing records.

8. Conclusion and Evaluation

To conclude, this report has detailed the design and implementation of a relational database system for a dental and orthodontic surgery. Overall, the system is a success. However there are some elements which could be improved in the future such as improving the relational structure and normalising the database.

9. Bibliography

- [1] J. A. Hoffer, Modern Systems Analysis and Design, 7th ed., Boston: Pearson, 2014.
- [2] Nanyang Technological University, "A Quick-Start Tutorial on Relational Database Design," 2010. [Online]. Available: https://www.ntu.edu.sg/home/ehchua/programming/sql/Relational_Database_Design.html. [Accessed 5 May 2018].
- [3] B. Holland, "L4 - Information Engineering (M4X01003)," 2018. [Online]. Available: <https://moodle.uwtsd.ac.uk/course/view.php?id=2042>. [Accessed 13 May 2018].

Information Engineering - Database Design

GRADEMARK REPORT

FINAL GRADE

70/100

GENERAL COMMENTS

Instructor

You presented a suitable database design in your access development there is no evidence of SQL have addressed this report and presented suitable SQL table development fires. Your forms the good design and you have used access functionality to improve the user experience. Good use of drop-down boxes to pick up data tables. We have indicated that you're building an invoice what you presented as a written report and invoice should query the individual patient present state just to them. Generally a good assignment and would have been well presented and reported.

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