

Database Design - Report

by David James

FILE	4073_DAVID_JAMES_DATABASE_DESIGN_-_REPORT_113987_792625498.DOCX		
TIME SUBMITTED	11-MAY-2018 08:06PM (UTC+0100)	WORD COUNT	990
SUBMISSION ID	89022262	CHARACTER COUNT	5799

DATABASE DESIGN – LOCAL DENTAL/ORTHODONTAL SURGERY

STUDENT ID: 1704050.

MODULE: M4X01003.

LECTURER: BEVERLEY HOLLAND.

COURSE: COMPUTER GAMES DEVELOPMENT.

TABLE OF CONTENTS

Introduction:	3
Entity Relationship Diagram:	3
Implementation:	6
Forms:	8
Reports:.....	11
User Guide:	12

INTRODUCTION:

As mentioned in the brief the task was to create a database for a local dental/orthodontal surgery called The Smile Factory. The database is expected to hold data such as patient information, staff information, surgery times and invoices.

ENTITY RELATIONSHIP DIAGRAM:

When reviewing the information within the brief the first approach was to start the design of the database to understand what tables are needed and what each tables relationship is across the database and how data is going to be shared.

As seen in Fig 1 an entity relationship diagram was created within Visio.

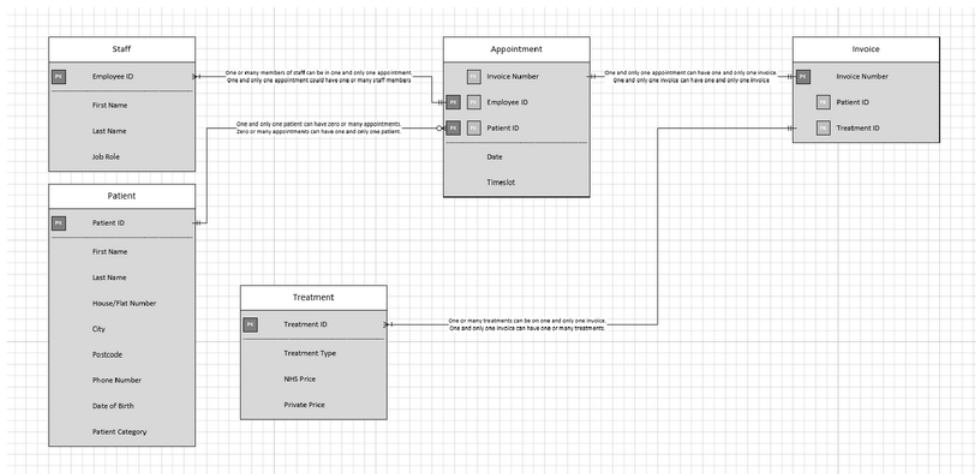


Fig 1.

The brief provided the necessary information to start a design for the database in Visio and gave a good idea on what tables would be needed for each object that would interact with the database.

The tables that were created are:

- Staff
- Patient
- Treatment
- Appointment
- Invoice

The staff table has a primary key "Employee ID" which gives each record within that table a unique identifier. Other attributes within the table were "First Name", "Last Name" and "Job Role".

The patient table has a primary key "Patient ID", this was to give each patient a unique identifier as some patients would potentially live at the same address or have the same name which doesn't provide a stable way to uniquely identify each patient.

The treatment table had a primary key "Treatment ID" this was to provide each treatment a unique identifier as well the reason for this is due to some treatments falling under the same category which didn't provide a stable way to uniquely identify each treatment within the database. Other attributes also included prices for both NHS and private patients along with the treatment type.

The appointment table is a bridge table where a composite key was decided to uniquely identify an appointment. Rather than giving an appointment an ID or number to identify it the primary keys from the patient and staff tables together provided a unique identifier for the appointments. Later when creating the database in Access it was decided that a composite key wasn't the most optimal solution and a new primary key "Appointment ID" was created instead, the reasoning for this was that a patient could have been assigned the same staff member for more than one appointment therefore no longer providing a unique identifier for every record within the appointment table. Other attributes within the appointment table are date and timeslot, this provides a way to store the information that makes up an appointment.

The final table is invoice and has a primary key "Invoice ID" to uniquely identify each record within the table, other attributes are patients first name, last name, address, etc.

The relationships are annotated within the diagram and listed below:

- Patient to Appointment – One and only one – zero or many.

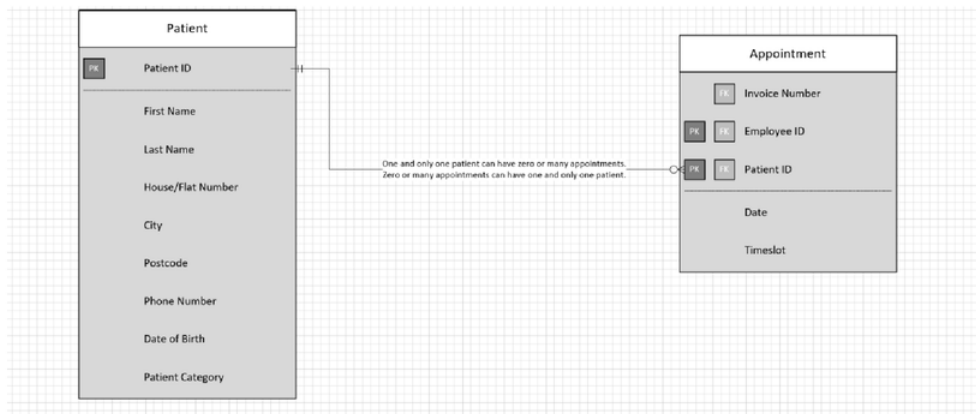


Fig 2.

- Staff to Appointment – Many to one – one and only one.

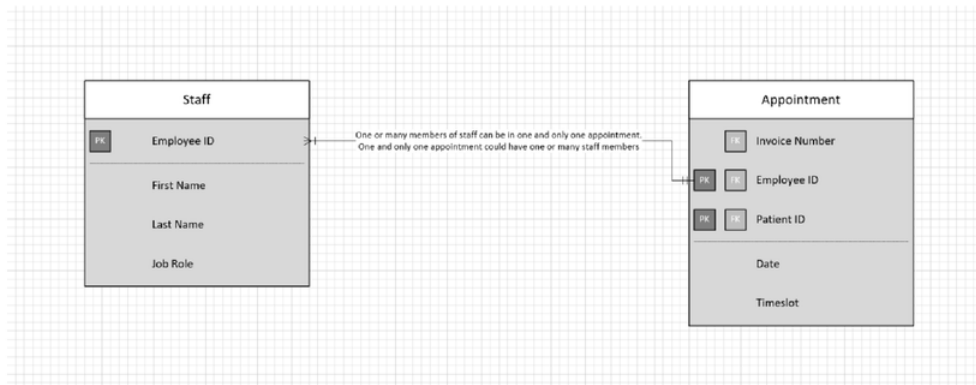


Fig 3.

- Treatment to Invoice

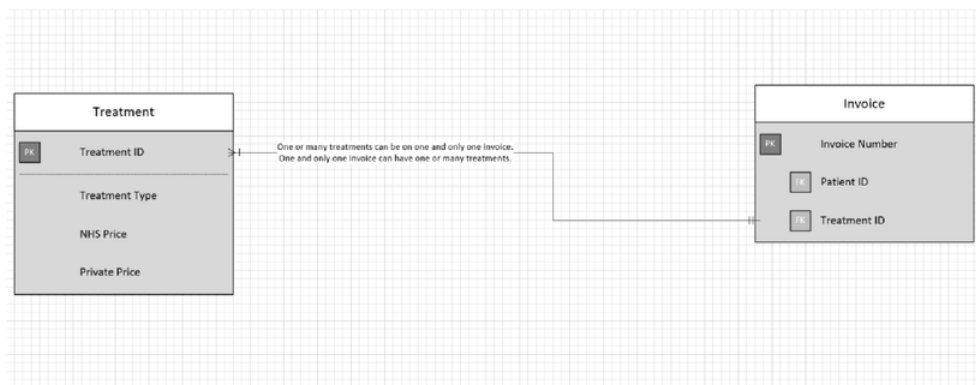


Fig 4.

- Appointment to Invoice

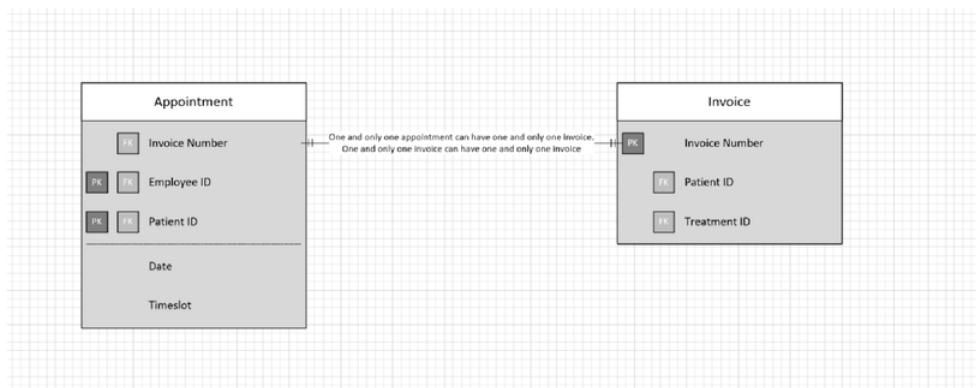


Fig 5.

IMPLEMENTATION:

Within Access the brief required a working database that followed the design of the entity relationship diagram along with the user requirements such as the ability to enter data through a form, access appointments and invoices.

The tables discussed above from the entity relationship diagram were created using SQL as seen below:

```
CREATE TABLE [Patient] (  
[Patient ID] AUTOINCREMENT,  
[First Name] TEXT(25),  
[Last Name] TEXT(25),  
[House/Flat Number] INT,  
[City] TEXT(25),  
[Postcode] TEXT(7),  
[Phone Number] TEXT(11),  
[Date of Birth] DATE  
CONSTRAINT PK_Patient_ID PRIMARY KEY  
);
```

Fig. 6

```
CREATE TABLE [Staff] (  
[Employee ID] AUTOINCREMENT,  
[First Name] TEXT(25),  
[Last Name] TEXT(25)  
CONSTRAINT PK_Employee_ID PRIMARY KEY  
);
```

Fig 7.

```
CREATE TABLE [Appointment] (  
[Invoice Number] INT,  
[Employee ID] INT,  
[Patient ID] INT,  
[Date] DATE,  
[Timeslot] TIME  
CONSTRAINT PK_Appointment PRIMARY KEY,  
CONSTRAINT FK_App_Invoice_Number FOREIGN KEY ([Invoice Number]) REFERENCES Invoice ([Invoice Number])  
);
```

Fig 8.

Create Treatment Table

```

CREATE TABLE [Treatment] (
[Treatment ID] AUTOINCREMENT,
[Treatment Type] TEXT(25),
[NHS Price] CURRENCY,
[Private Price] CURRENCY
CONSTRAINT PK_Treatment_ID PRIMARY KEY
);

```

Fig 9.

Create Invoice Table **Create Patient Table** **Create Staff Table** **Create Treatment Table**

```

CREATE TABLE [Invoice] (
[Invoice Number] AUTOINCREMENT,
[Patient ID] INT,
[Treatment ID] INT
CONSTRAINT PK_Invoice_Number PRIMARY KEY,
CONSTRAINT FK_Patient_ID FOREIGN KEY ([Patient ID]) REFERENCES Patient ([Patient ID]),
CONSTRAINT FK_Treatment_ID FOREIGN KEY ([Treatment ID]) REFERENCES Treatment ([Treatment ID])
);

```

Fig 10.

Following the design of the ER diagram once the tables were created the next step was to get the relationships between each table link correctly in order for data between tables to be shared appropriately.

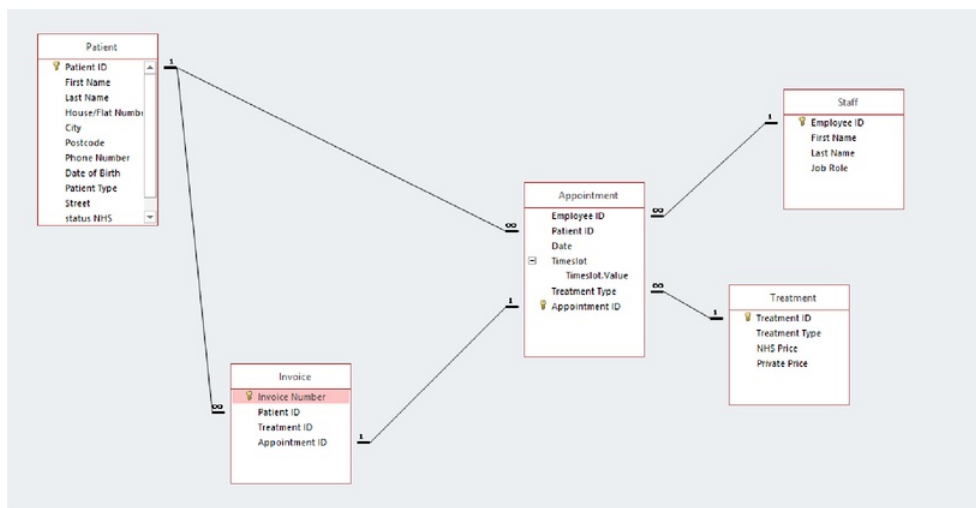


Fig 11.

FORMS:

Following the tasks within the brief forms were created for data entry and also finding records within the database.

Navigation buttons are included for each form for ease of use when wanting to skip through records for a particular table.

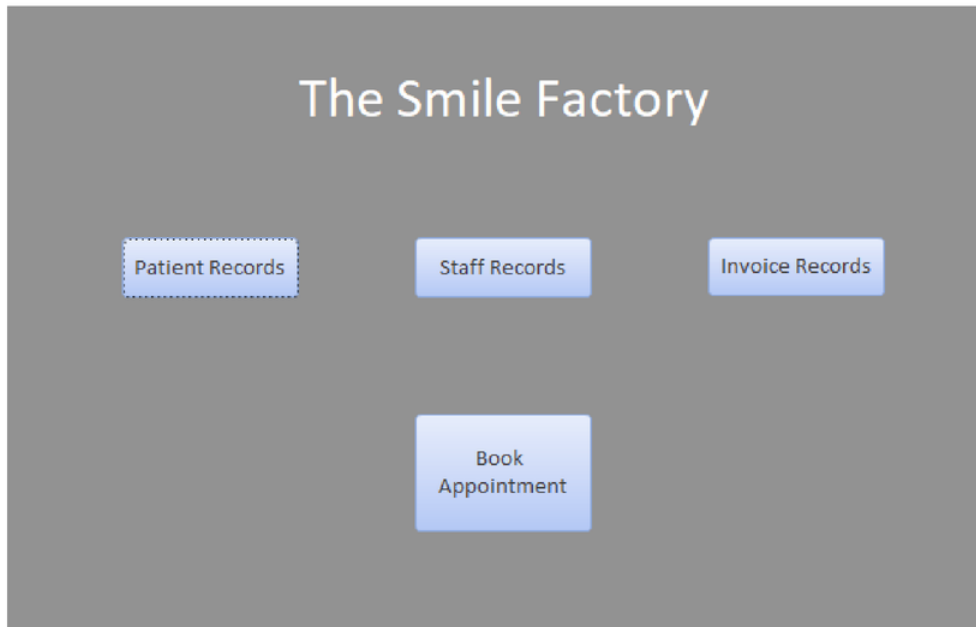


Fig 12.

The image shows a form titled 'Patient Records' with a grey header bar. The form contains several input fields and buttons. On the left side, there are four rows of labels and input fields: 'Patient ID' with a text box containing '2', 'Patient Type' with a dropdown menu showing 'NHS', 'Phone Number' with a text box containing '07002152850', and 'Date of Birth' with a text box containing '29/10/1980'. On the right side, there are four rows of labels and input fields: 'First Name' with a text box containing 'Joe', 'Last Name' with a text box containing 'Clements', 'House/Flat Number' with a text box containing '58', and 'Street' with a text box containing 'Rowland Road'. Below these, there are two more rows: 'City' with a text box containing 'Orcop' and 'Postcode' with a text box containing 'HR2 9AA'. At the bottom of the form, there are several buttons: a blue button with a left arrow, a blue button with a right arrow, a blue button labeled 'Add Patient', a blue button labeled 'Find Patient', a blue button labeled 'Remove Patient', a blue button with a left arrow, and a blue button with a right arrow. Below these buttons is a blue button labeled 'View Patient Report'.

Fig 13.

Staff

Employee ID

First Name

Ella

Last Name

Houghton

Job Role

Dentist

⏮

⏪

Add Staff Record

Find Staff Member

Delete Staff Record

⏩

⏭

View Staff Report

Fig 14.

Appointment

Employee ID

James

Date

23/05/2018

Patient ID

Katherine

Timeslot

10:00AM

Treatment Type

Cap On Tooth

Generate Invoice

⏮

⏪

Find Appointment

Add Appointment

Delete Appointment

⏩

⏭

View Appointment Records

Fig 15.

The screenshot shows a web form titled "Price" with a grey header. Below the header is a light grey form area. On the left side of the form area is a vertical sidebar with a right-pointing arrow. The form contains the following fields:

Field Label	Value
Patient ID	7
First Name	Katherine
Last Name	Parry
Patient Type	NHS
Appointment ID	8
Treatment Type	9
NHS Cost	£256.50
Private Cost	£0.00

Fig 16.

Due to problems implementing a working invoice system a price form was created to supply an invoice to print for each record of an appointment. A query was created to collate the data that is included on the invoice.

The query was implemented through the query wizard due to limited knowledge of SQL. A screengrab below illustrates the tables that are using in the query and what fields were included to retrieve the relevant data for each invoice.

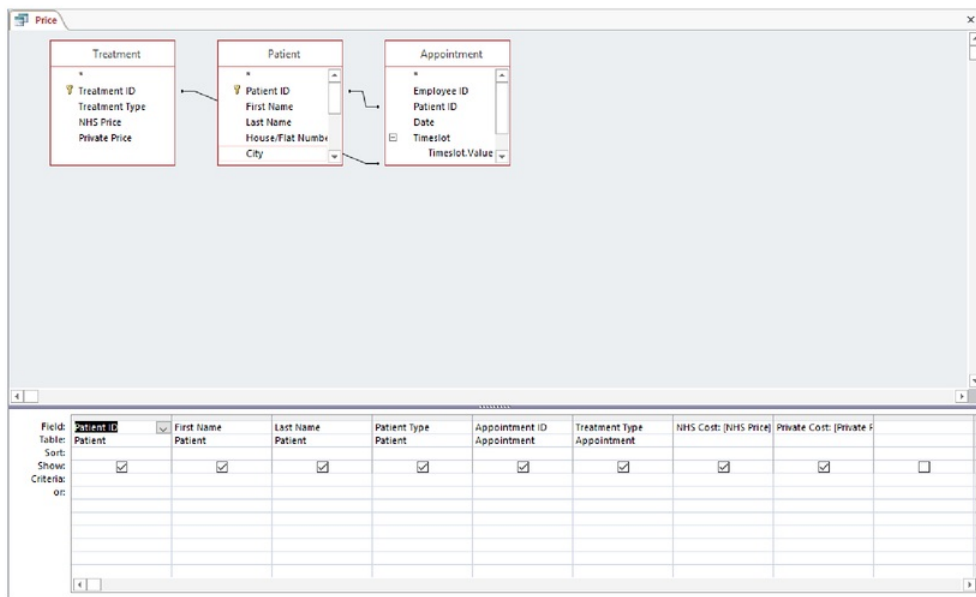


Fig 17.

REPORTS:

As seen below the following reports were captured as requested within the brief. The reports show all records that are within a given table:

Patient Records									
13 May 2018 4:02:43 PM									
Patient ID	First Name	Last Name	House/Flat Number	City	Postcode	Phone Number	Date of Birth	Patient Type	Street
1	Joe	Clements	58	Orpington	HR2 5AA	07902152850	29/01/1980	NHS	Rowland Road
2	Summer	Brady	22	Tottenham	NR22 2BU	07028292966	18/08/2006	NHS	Ford Street
3	Chloe	Onbourn	84	Wharfedale	W17 5Y2	07029222555	03/12/1988	Private	Trinity Crescent
4	Andrew	Parkers	7	Bethesda	SA33 3UN	07731557383	28/11/1993	Private	Northgate Street
5	Ethan	Ross	88	Kennelwood	DO8 8H4	07739119281	10/10/1992	Private	Widley Way
6	Katharina	Perry	79	Southminster	DO8 8H4	07903339605	02/02/1993	NHS	Hemington Court Road
7	Ben	Clements	87	Conington	DN11 9JG	07905548763	06/02/1988	Private	Mill Lane
8	Hollie	Clements	5	Albion	CY5 8BD	07079303986	16/02/1988	NHS	Widley Close
9	Ben	Rice	40	Hambleton Fab	LU1 1FF	0797935769	05/01/1991	Private	Angell Road
10	Cameron	Warren	62	Charlton	SN9 5AY	0790980350	26/11/1993	Private	Widley Road
11	Oliver	Tristram	92	Little Wood	AD3 8BB	0791311141	25/08/1990	NHS	Falmer Farm
12	Reece	Jeffer	37	Southend	PA28 8BD	0791388763	04/08/1994	Private	Marlborough Crescent
13	Nicole	Brown	47	Wey	BA2 3B3	07947802794	16/02/1972	Private	Newville Street
14	Max	Whitaker	30	Bridgehead	SA6 2NS	0776627718	11/02/1990	Private	Sutton Walk Lane
15	Isabelle	Robertson	34	Loddsworth	RG7 6E2	07943943886	09/11/1994	NHS	Union Terrace
16	Henry	Simpson	77	Gilling West	DL38 9BF	07946883510	23/02/1993	Private	Park Terrace
17	Charlie	Went	72	Remington	GU4 9HA	07913170007	09/11/1994	NHS	Lang Road
18	Madeleine	Went	84	Remington	GU4 9HA	07913170007	02/02/1994	Private	Grey Street
19	Charlie	Law	35	Aurbridge	GU4 9HA	07913170007	22/02/1994	NHS	Leicester Road

Fig 18.

Staff Records				11 May 2018
				4:47:42 PM
Employee ID	First Name	Last Name	Job Role	
2	Ella	Houghton	Dentist	
3	Jay	Wheeler	Dentist	
4	Hollie	Parry	Dentist	
5	Aimee	Miah	Dentist	
6	Adam	Metcalf	Dental Hygienist	
7	Alexander	Jennings	Dental Hygienist	
8	Taylor	Haynes	Dental Nurse	
9	Bradley	O'Brien	Dental Nurse	
10	Patrick	Abbott	Dental Nurse	
11	Natasha	Willis	Dental Nurse	
12	Edward	Hammond	Dental Nurse	
13	Holly	Martin	Dental Nurse	

Fig 19.

Appointment Records					11 May 2018
					4:53:04 PM
Employee ID	Patient ID	Date	Timeslot	Treatment Type	
Bradley	Andrew	19/05/2018	10:45AM		4

Fig 20.

USER GUIDE:

Each form consists of navigation buttons that allow the user to easily traverse through each tables records with the buttons clearly labelled which show their functionality.

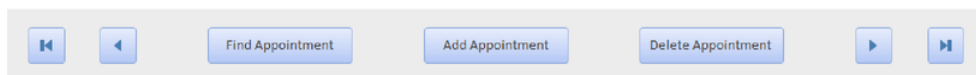


Fig 21.

Each form has a button that will show the first and previous record:

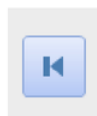


Fig 22.

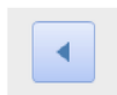


Fig 23.

Due to limited knowledge and experience with Access it was very difficult to get the main menu to load when opening the database, a menu form has been provided for easy access to navigate to a specific table.

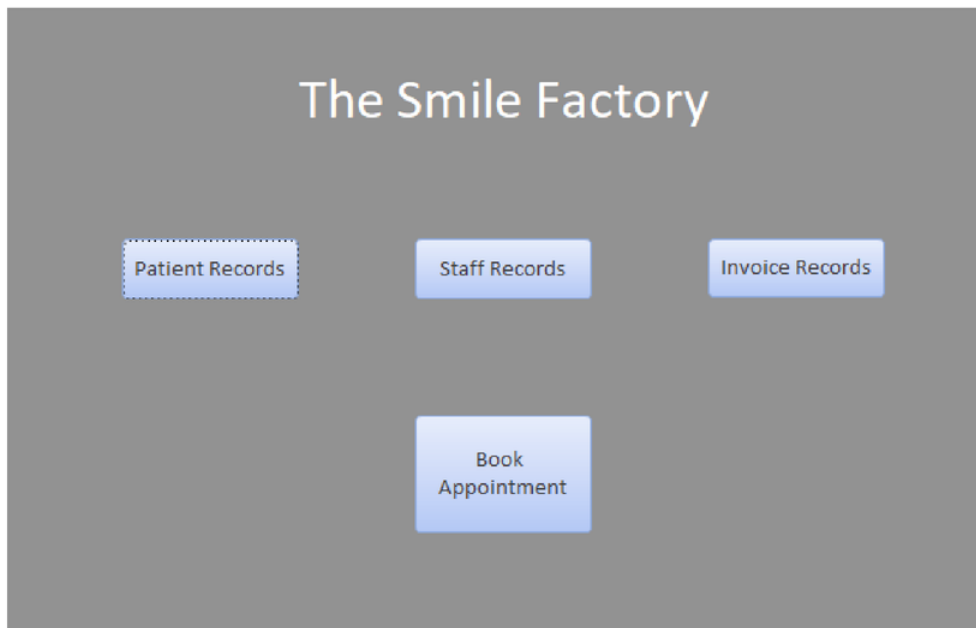


Fig 24.

CONCLUSION:

A deep analysis and understanding is needed when starting a database and is arguably the biggest and most important step to successfully implementing a working database. It is important to understand what objects interact with a system and what attributes those objects hold as these objects and their attributes form the data of the system. The relationships between objects is also important as this illustrates the flow of how data is passed around the system and where it is passed to.

By completing the ER diagram first before developing the database within Access was a fundamental starting point that gave good direction and preparation when it came to implementing the system in Access.

Database Design - Report

GRADEMARK REPORT

FINAL GRADE

63/100

GENERAL COMMENTS

Instructor

You Have designed a suitable scheme of your database and there is evidence of these of SQL to build your tables within the access environment.

The simplistic main menu however I have consistent form design this useful functionality added. You've used a suitable amount of test data when testing the functionality of the system. Have added some queries and some reports however the invoice does not work.

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13