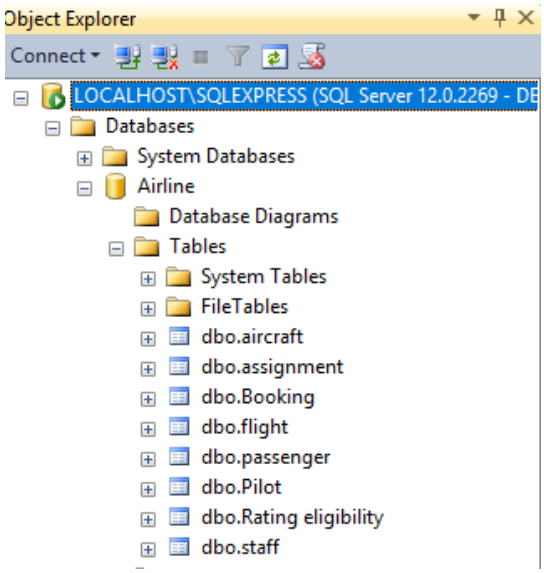
Implementation of queries and interactions with the database

Introduction

In the first part of this report, the system that was developed and implemented by using MS SQL Server to build the backend. It will be connected to MS Access database as a front-end during this part. The purposes behind this connection is maximizing big and trusted organizations surrounding database security and integrity. In addition, it increases data collaboration (sharing) and also keeps MS Access current with new releases of Microsoft Office.Utilizing an OBDC in both of MS Access database and SQL database is used to manage all the functions of a customer trip, starting of bookings airline assignments depending on departure time as well as arrival time. To be more specific in this report, I would to discuss the full mechanism of importing and connecting the contents that I created MS SQL Server database as a back-end with MS Access of creating robust database as front – end.

Connection process and updating ERD Diagram

Before starting to demonstrate the connection process, it should be explaining some considerations about the database that I was created in part1. So, I created eight different entities (Aircraft Entity, Booking Entity, Staff Entity, Passenger Entity, Pilot Entity, Assignment Entity, Rating eligibility Entity and Flight Entity) by using SQL Server (Management Express Edition 2014). Each Entity has several attributes, the details of each entity will be available in MS Access after the connection. See the figure below shows the Airline database in SQL Server.



Microsoft Access can be utilized as a front-end by connecting it to tables that exist inside SQL database. This is important that sense if developers need to begin building up Airplane company database, they can be relocated later to the bigger database administration frameworks. Now starting to demonstrate the connection process:

1. Stage 1 Select External Data > New Data Source > From Database > From SQL Server.

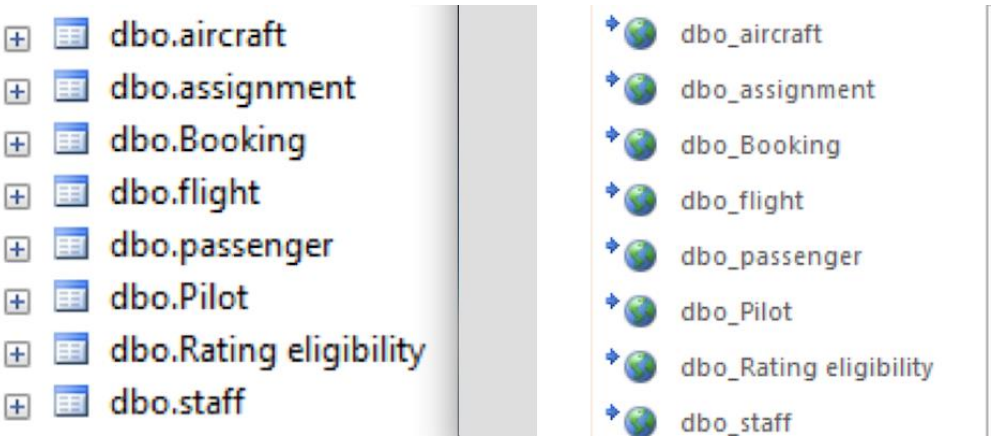
2. Stage2 ODBC Database dialog box has two options

- For importing option is to select Import the source data into a new table in the current database.
- For linking option is to data, select Link the data source by creating a linked table.
- Select OK

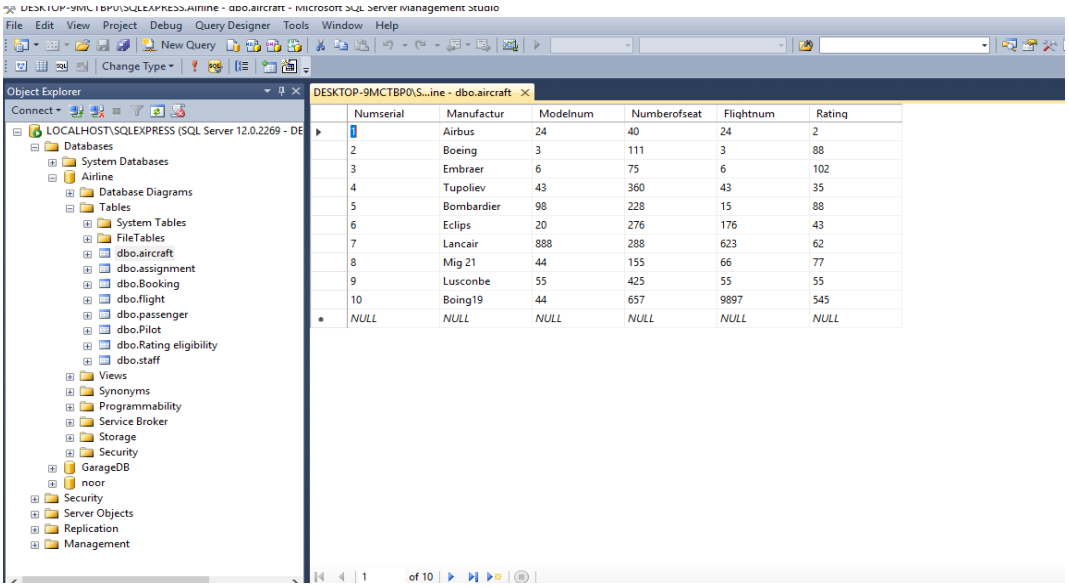
3. Stage3 Create a New Data Source to SQL Server wizard.
   - Choose the name of the linking or importing table.
   - Enter the name of the SQL Server.
   - Next
4. Stage4 Select Integrated Windows authentication.
   - Next
5. Stage5 Select Test Data Source to confirm the connection.
   - Next
6. Stage6 Link Tables or Import Objects dialog box, under Tables, select each table or view that the table need to link or import
   - Click OK
7. Stage7 the massage will appear about the connection is success or fail.

The connecting process for each table in my database completed successfully. Also, the tables that I link appeared in the Navigation Pane in MS Access with the same name as the SQL Server tables.

The figure below shows the navigation pane for the tables after successfully connected.

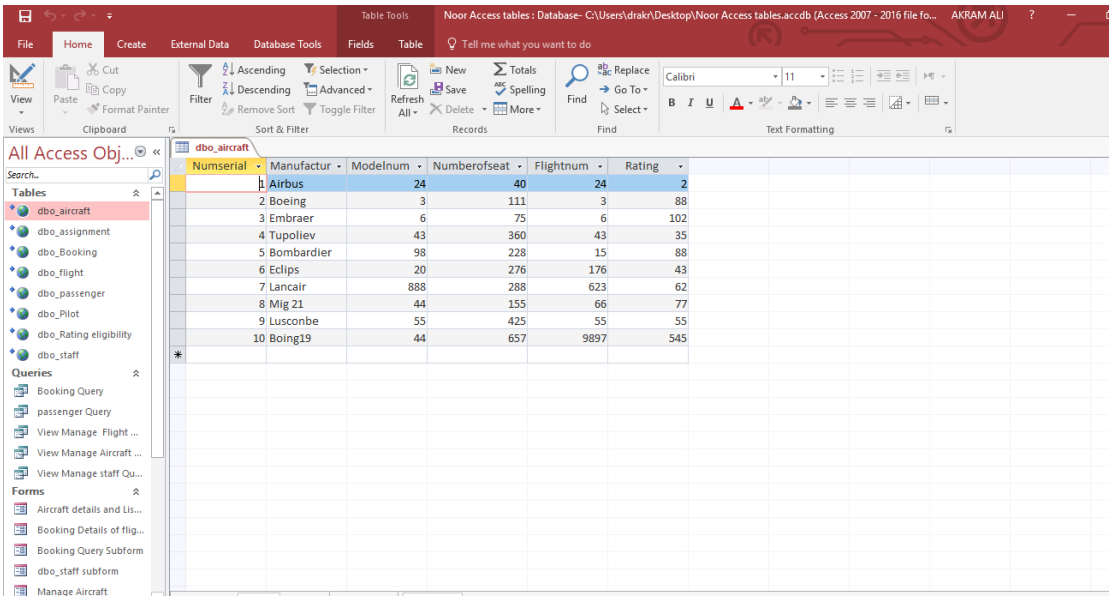


This Figure below shows the details table of Aircraft table in MS SQL Server



Numserial	Manufactur	Modelnum	Numberofseat	Flightnum	Rating
1	Airbus	24	40	24	2
2	Boeing	3	111	3	88
3	Embraer	6	75	6	102
4	Tupoliev	43	360	43	35
5	Bombardier	98	228	15	88
6	Eclips	20	276	176	43
7	Lancair	888	288	623	62
8	Mig 21	44	155	66	77
9	Lusconbe	55	425	55	55
10	Boing19	44	657	9897	545
NULL	NULL	NULL	NULL	NULL	NULL

This Figure below shows the same details of Aircraft table which appeared in MS Access after successfully connection.



Numserial	Manufactur	Modelnum	Numberofseat	Flightnum	Rating
1	Airbus	24	40	24	2
2	Boeing	3	111	3	88
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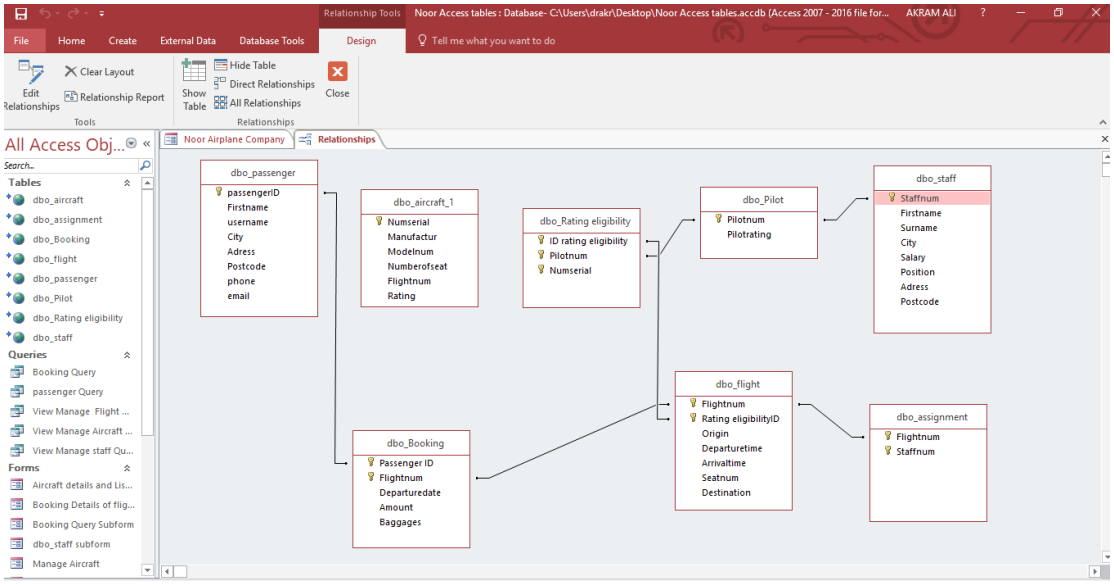
6	Eclips	20	276	176	43
7	Lancair	888	288	623	62
8	Mig 21	44	155	66	77
9	Lusconbe	55	425	55	55
10	Boing19	44	657	9897	545

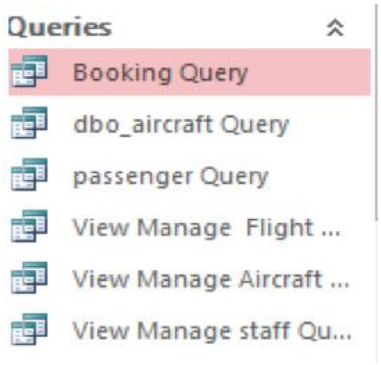
After the connection, it needs to build (ERD Diagram) relationship between tables in Access in order to the system work successfully. The figure below shows each Entity and its attributes, and how to build relationships between them.



Navigation map (Description the functions of the system)

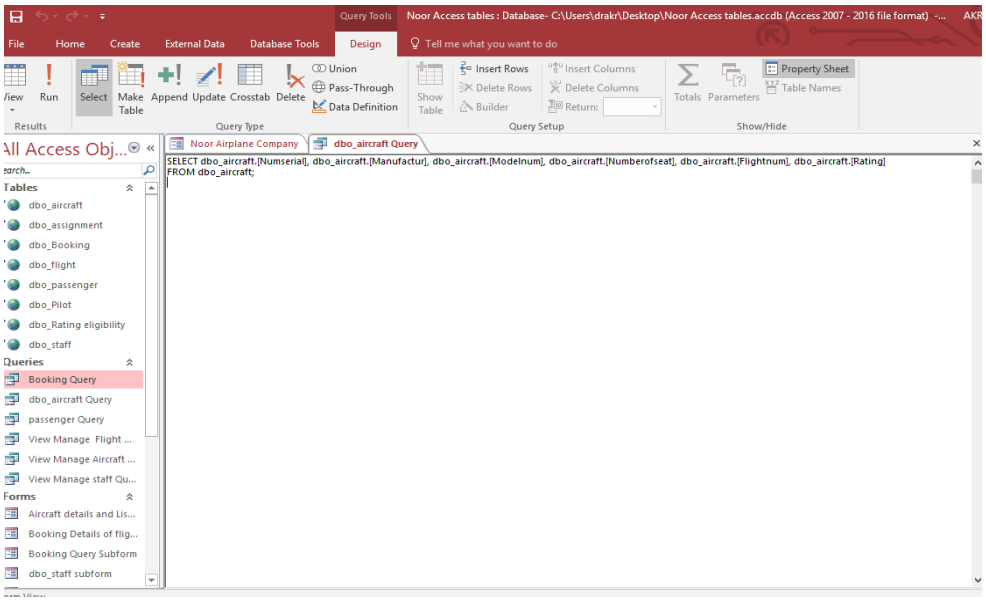
- Queries

Query is a primary mechanism consists of questions that presented to the database in a predefined format for retrieving information from it. In fact, these an expression stored information have a unique name in the core of the database. There are several functions that describe exactly what the database designer can do inside Query Tables like Make _Table, Add, Delete and update. In this system, I used Wizard Query to create six important queries.

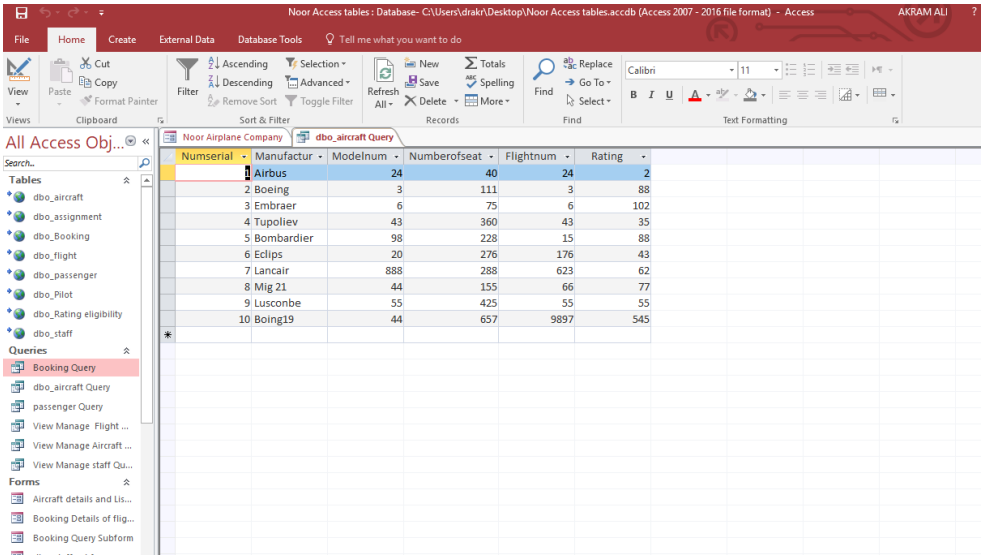


The figures below show how to create one of my queries for Aircraft table. Also, I followed the same steps for the other queries.

SQL Aircraft codes



Aircraft Query



Numserial	Manufactur	Modelnum	Numberofseat	Flightnum	Rating
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3	Embraer	6	75	6	102
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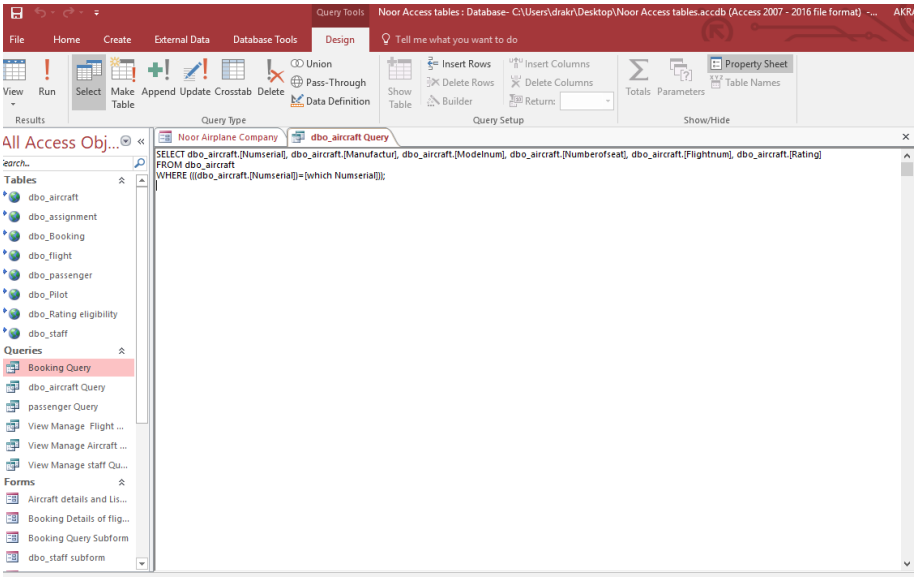
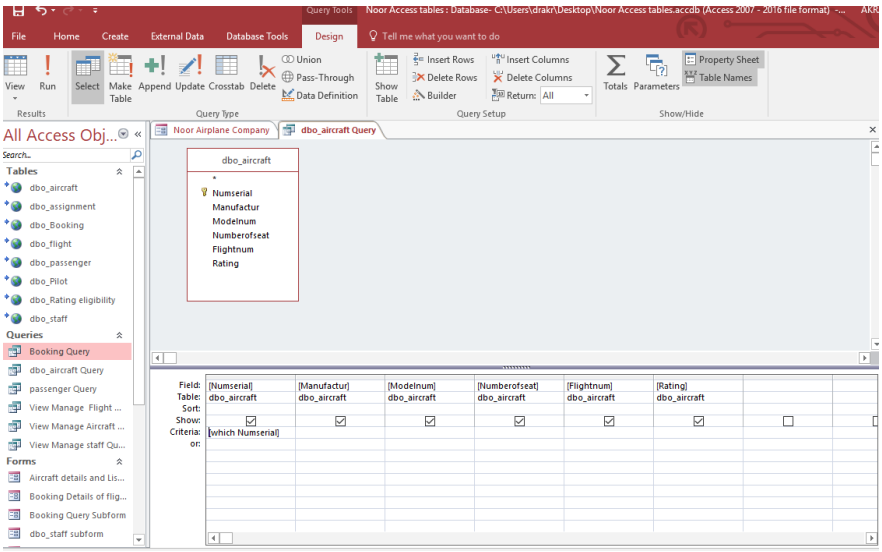
8	Mig 21	44	155	66	77
9	Lusconbe	55	425	55	55
10	Boing19	44	657	9897	545

Adding code to create parameter for Aircraft Query

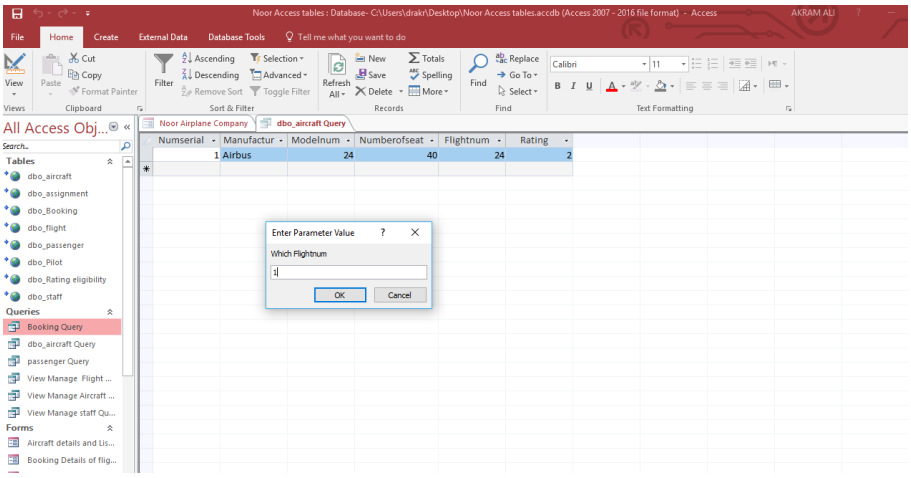


```
SELECT dbo_aircraft.[Numserial], dbo_aircraft.[Manufactur], dbo_aircraft.[Modelnum], dbo_aircraft.[Numberofseat], dbo_aircraft.[Flightnum], dbo_aircraft.[Rating]
FROM dbo_aircraft
WHERE (((dbo_aircraft.[Numserial])=[which Numserial]));
```

Design View for Aircraft Query



Implement the parameter for Aircraft Query



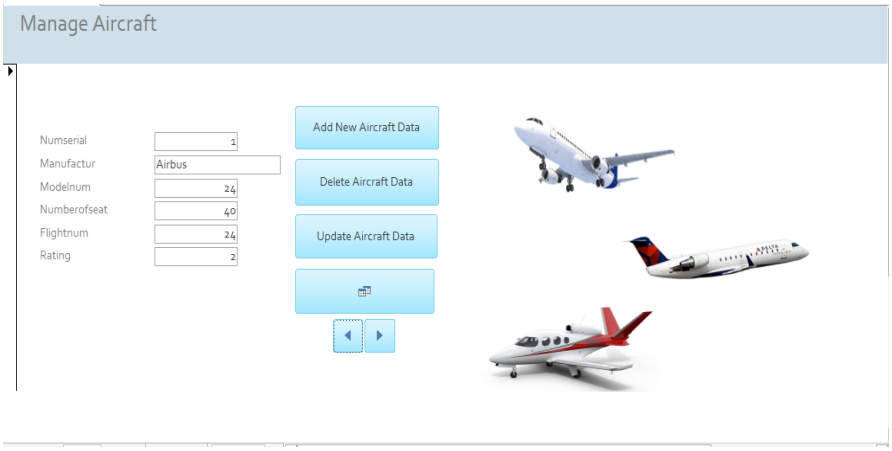
- ## Forms

Form is way utilized for recording information in MS Access. Most of database designers prefer to enter and edit information by using the form design tools in Access. This is because it very flexible and simple to customize forms with wide range of features. It is very important to mention that there are few different methods that used to create forms. For this system, I used Form wizard to create different forms.

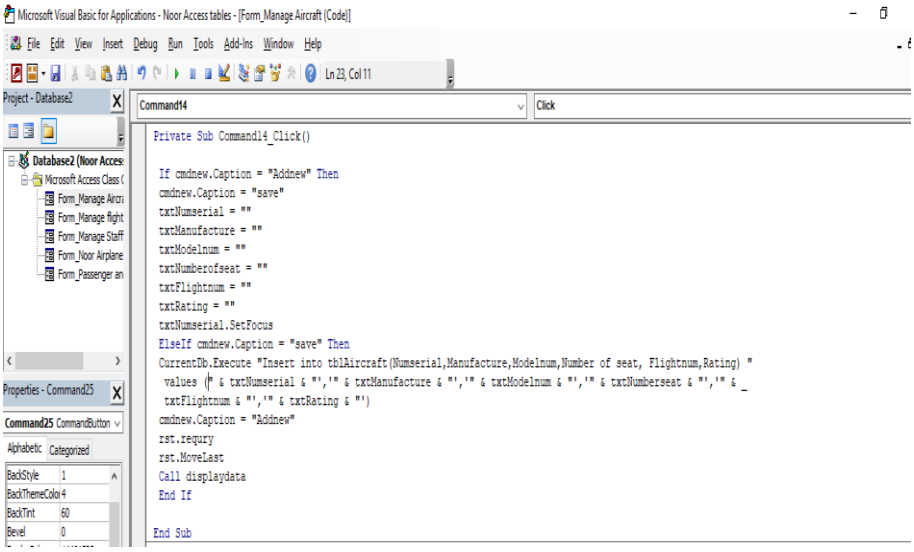
- **Add/Delete/Update and View Aircraft Form**

This form is used to send details to the Aircraft table when the button, add record is clicked. Figure Below shows the Aircraft form and its options (Add, Delete, Update) with its codes. And I used the same steps for all the form in my database.

Manage Aircraft Form



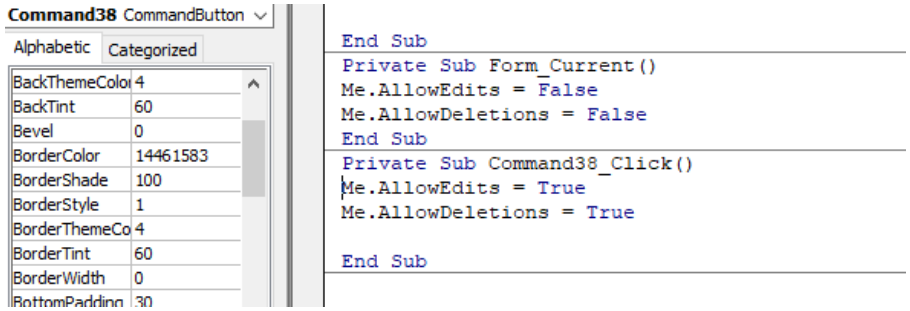
Add button vb.net code



Delete button vb.net code

```
Private Sub Command25_Click()
If MsgBox("are you sure you want to delete this record?", vbYesNo) = vbYes Then
CurrentDb.Execute "Delete from tblAircraft where Numserial = '" & txtNumserial & "'"
rst.Requery
rst.MoveLast
Else
Exit Sub
End If
Call displaydata
End Sub
```

Update button vb.net code



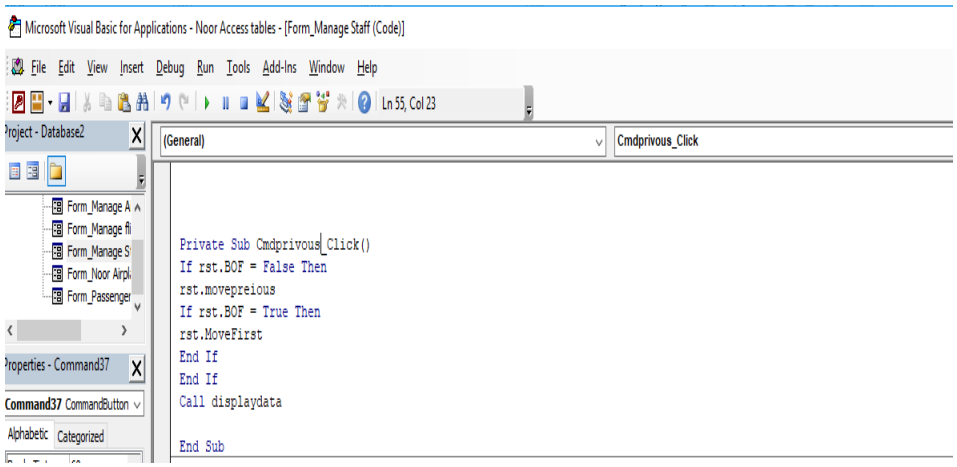
Move Next button vb.net code

```
Private Sub CmdNext_Click()

If rst.BOF = False Then
rst.MoveNext
If rst.BOF = True Then
rst.MoveLast
End If
End If
Call displaydata

End Sub
```

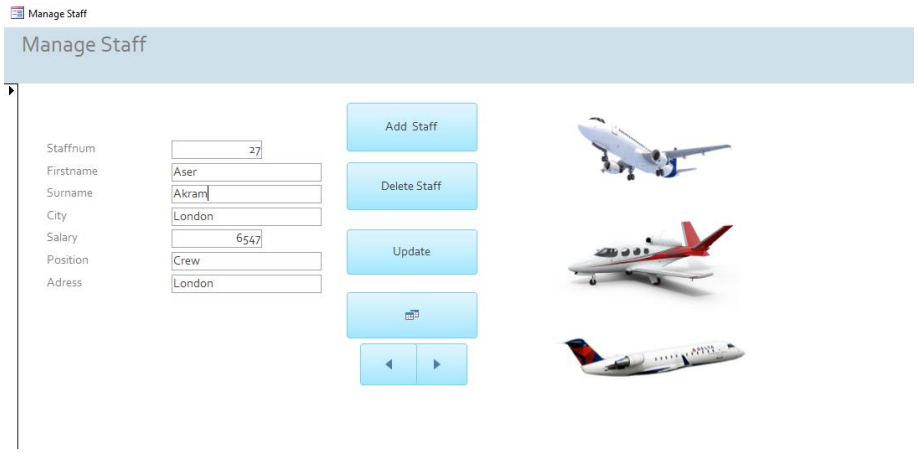
Move Previous button vb.net code



- **Add/Delete/Update and View Staff Form**

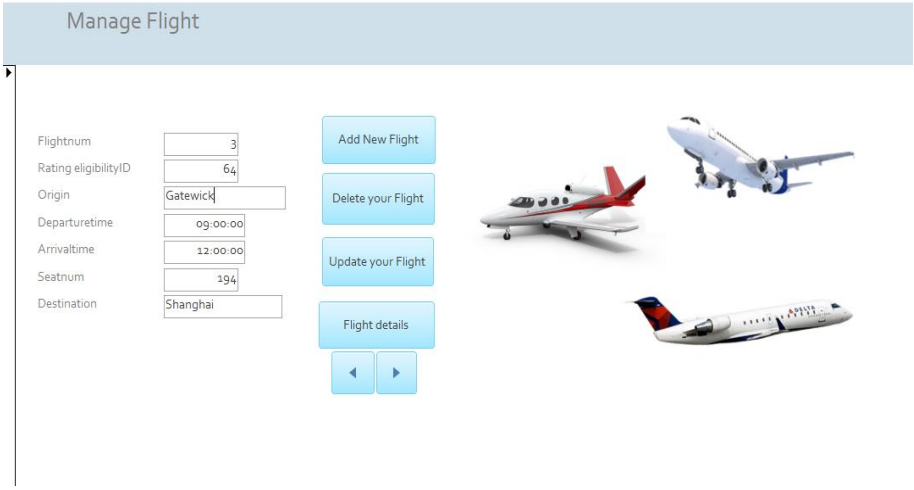
Creating Staff form gives chance to add, delete, update and save, the details of staff in the staff table. It can be navigating between staff information and viewing their details easily when click next and previous record buttons. The screenshots below show the Manage employee form.

Manage Staff Form



- **Add/Delete/Update and View Flight Form**

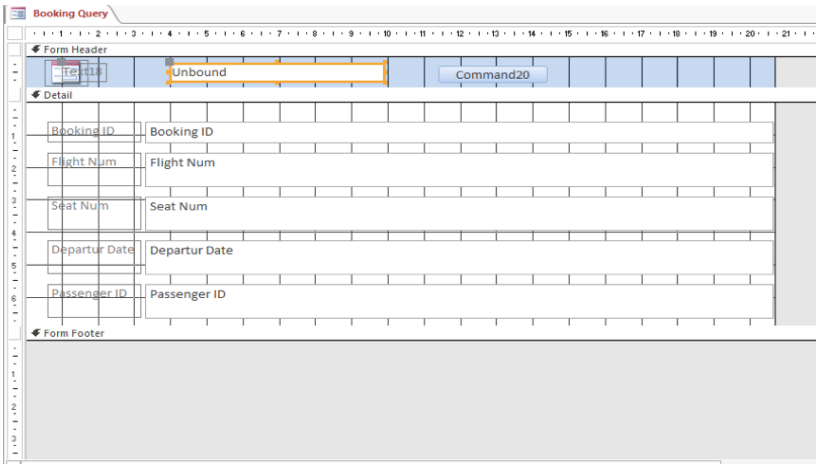
Manage Flight Form



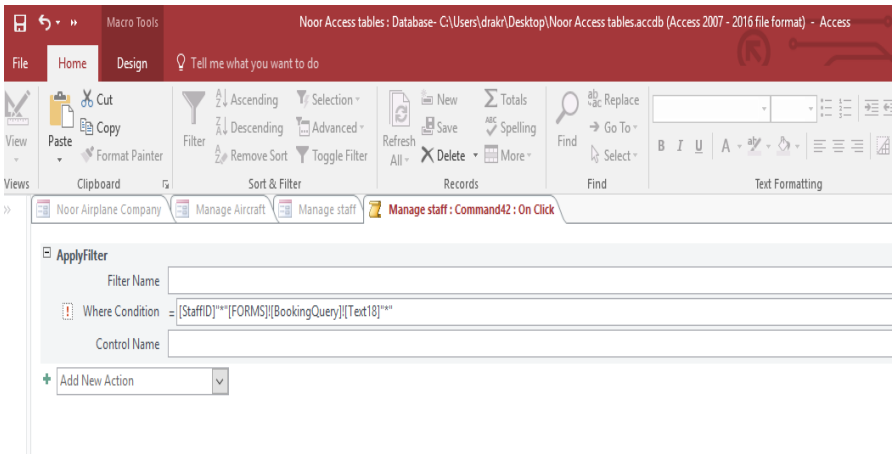
- **How to add Search Button to the forms**

For searching about Booking details, it need to add search button to the Booking Query Form, following the steps and screenshot how to do that:

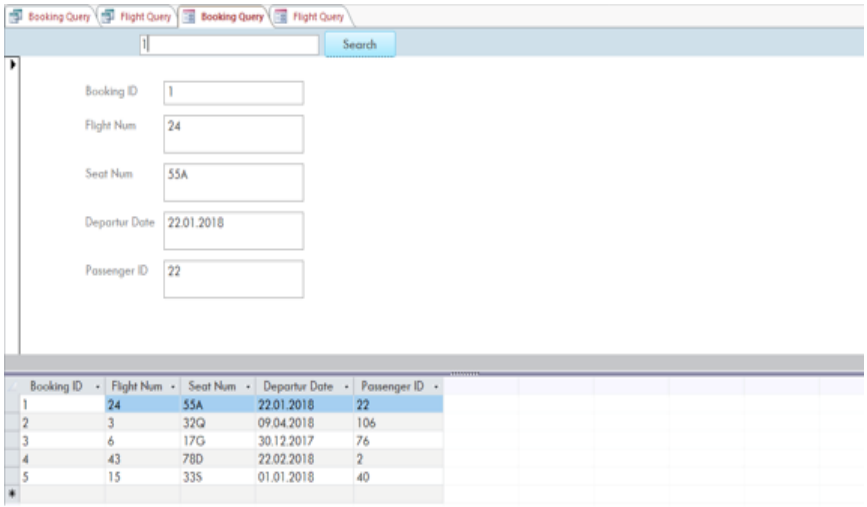
1. Create Form by using Form Wizard and I select Booking Queries that I created it before.
2. Split the Booking Query Form into two parts.
3. Activate the Booking Query Form to View Design mode, see the figure below



4. Drag and Drop the Text and Command options from the toolbar
5. Click on the Command then click the properties pane
6. Determine the event option.
7. Once clicking on the small right box, there is multiple options will appear
8. Click the Where Condition option and write the following code
   [Staff ID]”*” [Forms]![Booking Query]![Text18]”*’

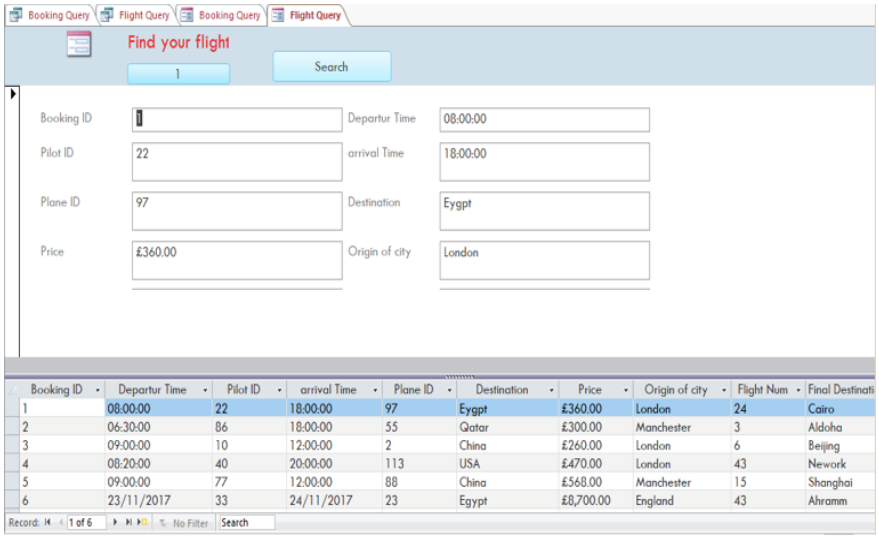


8.Return the Booking Query to View mode, the search button works successfully. So, it easy now to find the details of bookings for this system, see figure below



- **Search/browse of Flight details**

I did the same steps above to browse about each flight and its details.

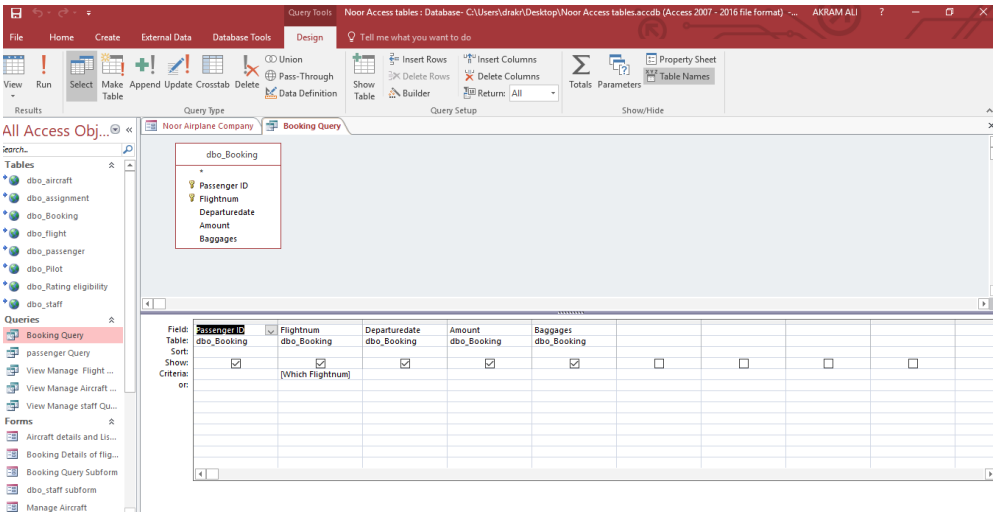


- **Other Searching methods**

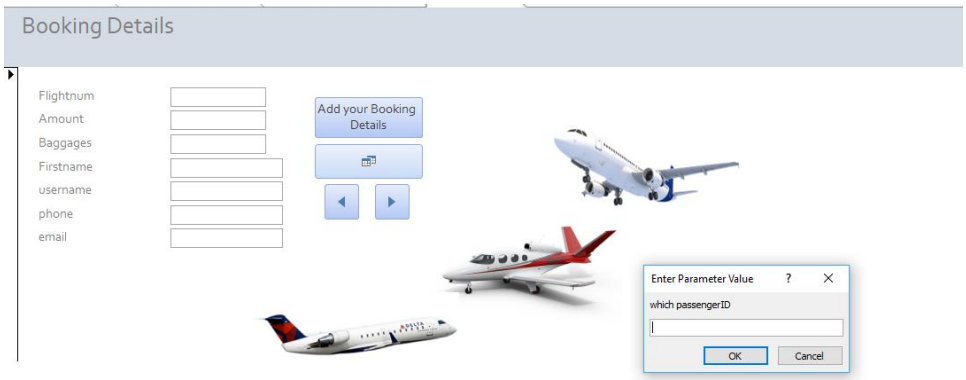
It can add other different way for searching by connecting the query from inside the form.

The example below shows how to do that:

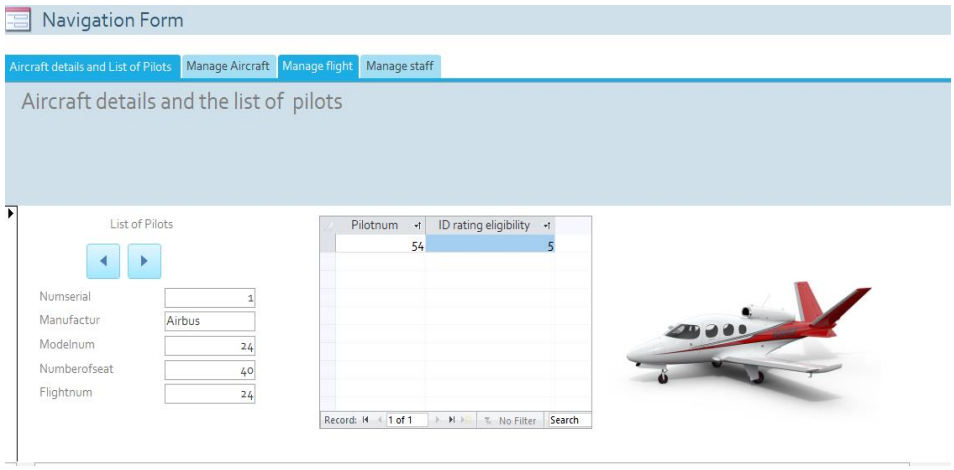
1. Create Booking Query



2. Then, I created Booking Details Form
3. Next, I added button (Add your Booking Details) by using open Run Query >Booking Query> finish.
4. When click the button (Add your Booking Details), the (Enter Parameter Value) window will open and ask the users to add their ID number.



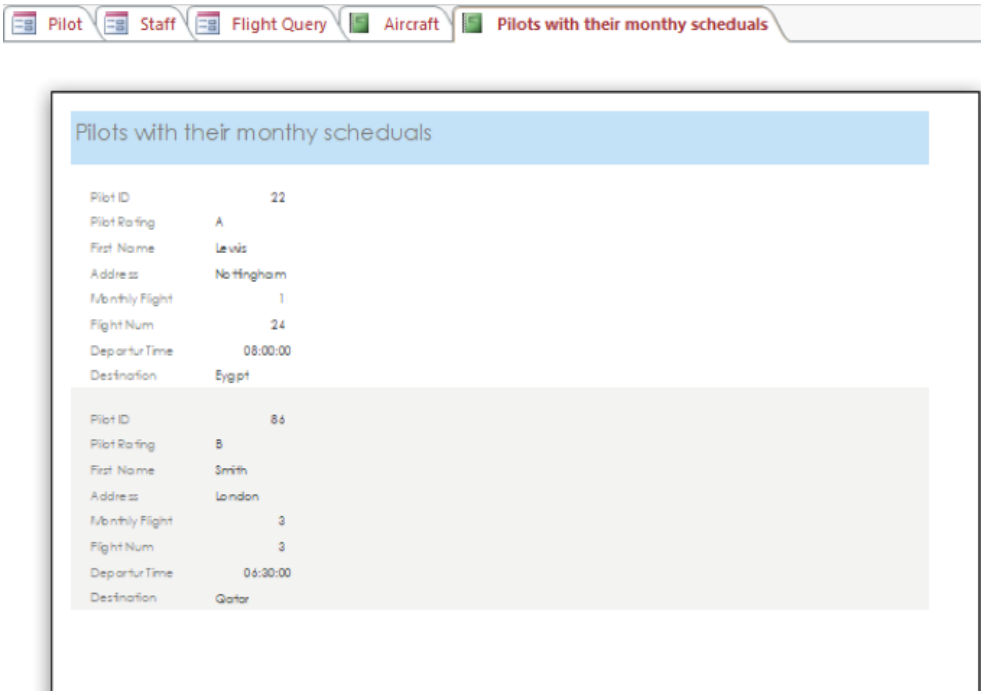
- **Aircraft details and list of pilots eligible to fly it**
  The process for creating this form by using sub form to browse about Aircraft details and the pilot who eligible to fly it. See the figure below



Reports

Report is a smart way to summaries and presents the information in the database for easy online printing and attractive viewing on screen. In fact, it enables to display big layout and highlighting all the main facts and trends. So, the main purpose of creating a report is only for presenting data, not for altering the underline data in the tables. Although There are different ways for creating a report, it is also very similar to create a form by retrieving data from one or more tables and queries. When a report is opened in MS Access each time, it will present the most recent data in a Print preview. Using the report button helps designer to create a simple report that displays all the records of the selected table or query in using a columnar format.

- **Pilots schedule monthly**



- **Working hours for pilots**

Working hours	First Name
48	David
66	Farhan
72	Lewis
115	Berry
124	Smith
235	John

Working hours for all pilot

Working hours	48
Pilot ID	12
Pilot Rating	B
First Name	David
Monthly Flight	1
Working hours	66
Pilot ID	77
Pilot Rating	A
First Name	Farhan
Monthly Flight	2
Working hours	72
Pilot ID	22
Pilot Rating	A
First Name	Levis
Monthly Flight	1

- **List of company destinations and schedules**

company destinstion schedule

company destinstion schedule

Flight Num	Departur Time	arrival Time	Destination	Origin of city
24	08:00:00	18:00:00	Eygpt	London
3	06:30:00	18:00:00	Qatar	Manchester
6	09:00:00	12:00:00	China	London
43	08:20:00	20:00:00	USA	London
15	09:00:00	12:00:00	China	Manchester
43	23/11/2017	24/11/2017	Egypt	England

➢ Number of Staff and their Position

dbo_aircraft | Number of passenger by flight | Number of Staff and their Positions

Number of Staff and their position

28 November 2017
23:25:02

Staffnum	Firstname	Surname	City	Salary	Position	Adress	Postcode
27	Aser	Akram	London	6547	Crew	London	hhgg
29	David	Lewis	London	1244	Crew	Wellton	324567
76	Berry	Mat	Spondon	1266	Pilot	Spondon	retysd
84	Shahzad	Ali	Derby	2345	Pilot	Derbyshire	3erfd
105	Cathrin	Pukky	Manchester	1457	Crew	Mantchester	hgbvf
773	Ahmed	khan	Conventery	2436	Tech	Conventery	yturo

Page 1 of 1

➢ Number of Passengers by Flight

dbo_aircraft | Number of passenger by flight

Number of passegers by Flight

28 November 2017
23:24:03

Numserial	Manufactur	Modelnum	Numberofseat	Flightnum	Rating
1	Airbus	24	40	24	2
2	Boeing	3	111	3	88
3	Embraer	6	75	6	102
4	Tupoliev	43	360	43	35
5	Bombardier	98	228	15	88
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8	Mig 21	44	155	66	77
9	Lusconbe	55	425	55	55
10	Boing19	44	657	9897	545

Page 1 of 1

- **Passenger and their Details**

dbo_aircraft | Number of passenger by flight | Number of Staff and their Positions | Pssengers and their Details

Passengers and their Details

28 November 2017
23:25:44

passengerID	Firstname	username	City	Adress	Postcode	phone	email
28	David	Smith	Derby	Derbyshire	DL3 5NG	3265589876	Jonnas@ymail.com
78	Sandy	James	London	HyseTown	BH8 3GL	56748930221	Sandy@Gmail.com
93	Noor	Alhamdawee	Derby	Roditch way	3LN DGR	7645389212	Noor@ymail.com
200	Robert	Robenson	Derby	Uttoexter Road	De22 ugd	4536782900	Ropert@Yahoo.com
266	Ahmed	Saleh	Nottengham	Derbyshie	BNC 23H	6458392767	Ahmed@gmail.com
387	Jon	Lwies	Derby	Derbyshire	FR2 JSL	8576435798	Jonnas@ymail.com

Reflection of the technologies which chosen to build the Airplane company database system

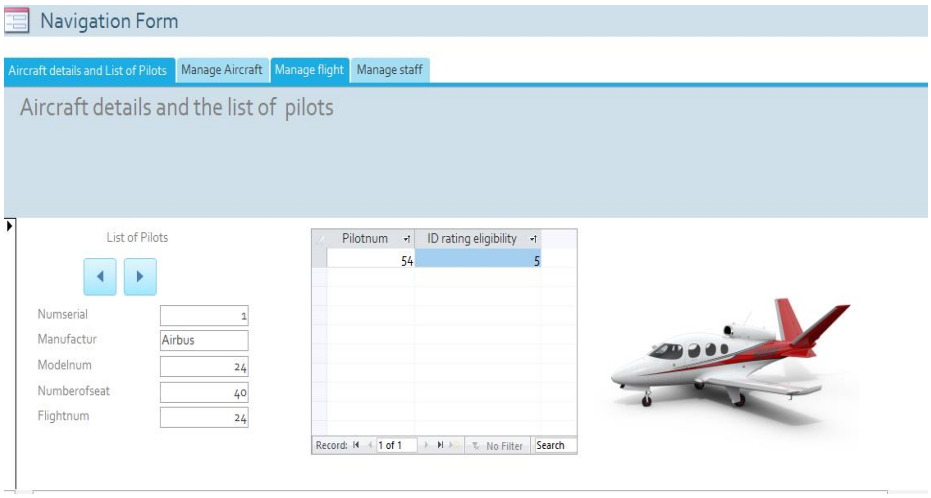
In this report, both of MS Access and SQL Server are used to manage all the functions for Airplane company database. Using Microsoft Access is a relational database management system from Microsoft which combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools. One of the main benefits of Access is its relative compatibility with SQL queries. This means, it provides a special syntax that allows creating queries with parameters, in a way that looks like creating stored procedures. Furthermore, it can be utilized as a part of the front-end for back-end tables with items like Microsoft SQL Server and non-Microsoft items like Oracle. Also, advantages of MS Access are that it is much easy to integrate. It uses for functions estimably with a number of the established programs situated in Windows. On the other hand, there are some disadvantages of such a development, the stored procedures are limited to one statement per procedure. Also, the major limitations of Access are to build a database is that MS Access is not as robust as MS SQL Server or Oracle. MS Access is used by small businesses, within departments of large corporations, and by hobby programmers to create desktop systems for handling the creation and manipulation of data. Some professional application developers use Access for rapid application development, especially for the creation of prototypes and standalone applications that serve as tools for on-the-road salesmen.

MS SQL Server is not a free and open – source database, however, Microsoft give programmers a chance to create database by using SQL Express edition. SQL Express edition 2008, 2010 and 2014 versions are free and include almost all functionality of full featured SQL server with the limitation of supporting on 10 GB of Database. These versions of SQL Server database have multithreaded and multi-user database management system which has millions of installations. MS SQL Server includes a board sets of SQL Server Profiler, as well as SQL Server Management Studio, updatable views, stored procedures and cross-platform support. There are two methods for creating database in MS SQL Server. firstly, by using table design: is a smart way for building database tables. Secondly, by using queries: it used to create database by drawing, string and logical codes. However, MS SQL Server is an expensive tool and it difficult to learn in comparison with other products like Access and My SQL. MS SQL Server need to make a new big investment frequently to get latest and new development environment from Microsoft package.

Microsoft family runs VB.NET Codes to support MS Access database to build robust frond-end. This means, the vb.net gives the designer opportunity to add multiple functions such as insert, delete and update buttons by adding codes behind them.

User Manual

The Airline Company has great control over the functionality that an individual user has within the system. The administrator system can carefully manage access, availability and usability for the company customers. When the admins open MS Access, they can add, delete, update details of Aircraft, Staff and flight forms. Then, the data will be changed in the core of SQL Server database. In addition, they can view bookings details, add new passenger and generate reports. The users can run the system on their machine easily and the list of different functions is available and simple to use. In addition, the users can interact with all these objects by open Database Management System. The figures below show the main page and the navigation page for this database system.



Conclusion

This system is effective, and all its functionalities are easy to use, follow and manage for both the administrator and the users. MS Access is the number one choice for a relational database management system. Apart from Access, Microsoft SQL Server can be used for the same purpose. This paper highlights two important points. First of all, the full mechanism of MS SQL Server of creating robust database as back – end. Secondly, the extracting and connecting the contents that created in SQL database with Access. After the connecting, the Front-end and the Back-end can be managed from the same place. Then, describing how to create tables, queries forms and reports in the core of MS Access system. In addition, explaining some functionality that used to build the frontend by using Vb.net codes. Finally, describing how the user can interact with the system manually.

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