SAGAR COLLEGE OF BCA JALNA

PROJECT REPORT

ON

IT SOFTWARE SOLUTION FOR BUSINESS

SUBMMITTED TO

DR.BABASAHEB AMBEDKAR MARATHWADA

UNIVERSITY SAMBHAJI NAGAR

IN THE PRATICAL FULFILLMENT FOR THE DEGREE

BACHLAŔ OF COMPUTER APPLICATION

ACADEMIC YEAR

2022-2023

SUBMITTED BY

KIRAN RAVAN KHARAT

UNDER THE GUIDEANCE OF BCA

B.E.SURADKAR

(LECTURER DEPT OF MANEGMENT SCIENCE)

SAGAR COLLEGE OF BCA JALNA

CERTIFICATE

This us to certify that Kiran Ravan Kharat is bonafide student of Bachelor of Computer Application (B.C.A) of Sagar College of BCA Jalna.

I here by certify that this project report on IT SOFTWARE SOLUTION FOR BUSINESS is an original And junior work carried out in partial fulfillment of the requirement of the Bachelor of Computer Application (BCA TY) for the year 2022-2023 the information is true and original to the best my knowledge.

Internal Examiner

External Examiner

Principal

Skill India
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India skills

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National
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Test Project

Skill- IT Software Solutions for Business

Category: Information and Communication Technology

Skill- IT Software Solution for Business

Skill Explained

The rapid pace of globalization over the past decade has been largely driven by developments in Information and Communication Technology (ICT). IT specialists are increasingly in great demand in several areas, one of which is providing software solutions for businesses.

The development of software solutions to improve business productivity encompasses many different skills and disciplines. Key to these is an awareness of the fast changing nature of the industry and the ability to keep up with the rapid pace of change.

IT software solution professionals always work closely with clients to modify existing systems or create new systems. They may modify "off the shelf" software and integrate it into the existing systems. They often work as part of a team of software professionals responsible for the requirement specification, system analysis and design, construction, testing, training, and implementation, as well as maintenance of a business software system.

Eligibility Criteria- Competitors born on or after 01 Jan 1997 are only eligible to attend the Competition

Duration of Test project: 4 hours

Preface

Section A-Test Project
Section B-Marking Scheme
Section C-Infrastructure List (Tool and equipment including raw material)
Section D- Instruction for Competitors
Section E- Health, Safety and Environment

Section A

Test Project

DURATION OF TEST

12 hours only

Part 1 is a **desktop application** and Part 2 is **a mobile application** that needs to be developed by the competitor.

The total duration for each project Module is **3 hours only.**

PART 1

MODULE 1 DESKTOP APPLICATION DEVELOPMENT

INTRODUCTION

PART 1 of the Test Project consists of the following documentation/files:

- WSC2017_TP09_S1_EN.pdf (Session 1 instructions)
- Session1-MySQL.sql (SQL Script to create tables with data for MySQL)
- Session1-MsSQL.sql (SQL Script to create tables with data for Microsoft SQL)
- UserData.csv (User information to be imported in the database)

AMONIC Airlines has offices in different locations based on the countries they have active flights on. The automated software system which is the subject of this Test Project will be available to managers and system operators at those offices. The first point of entry of the system is the login form and the authentication system.

The following basic characteristics for the solution must be fulfilled in this session:

- Provide access to different sections of the system based on each user's role
- Control and monitor clients' access to the system

DESCRIPTION OF PROJECT AND TASKS

While developing the Test Project, please make sure the deliverables conform to the basic guidelines drawn out by different departments at AMONIC Airlines:

- There should be consistency in using the provided style guide throughout development.
- All required software modules must have applicable and useful validation and error messages as expected by the industry.
- Where applicable, use comments in code to have the code more programmer-readable.
- The use of valid and proper naming conventions is expected in all material submitted.
- Any form or report once created should be displayed in the centre of the screen.
- When a form or a dialogue is in focus, operations on other forms need to be suspended.
- The caption of Delete and Cancel buttons need to be in red to help with accidental mishaps.
- When using colours to differentiate between rows or records, there needs to be visible clarification on the screen as to what they stand for.
- The wireframe diagrams provided as part of this document are only suggestions and the solution produced does not have to be, in any way, mirror what has been pictured.

- Time management is critical to the success of any project and so it is expected of all deliverables to be complete and operational upon delivery.

DURATION OF MODULE

3 hours only

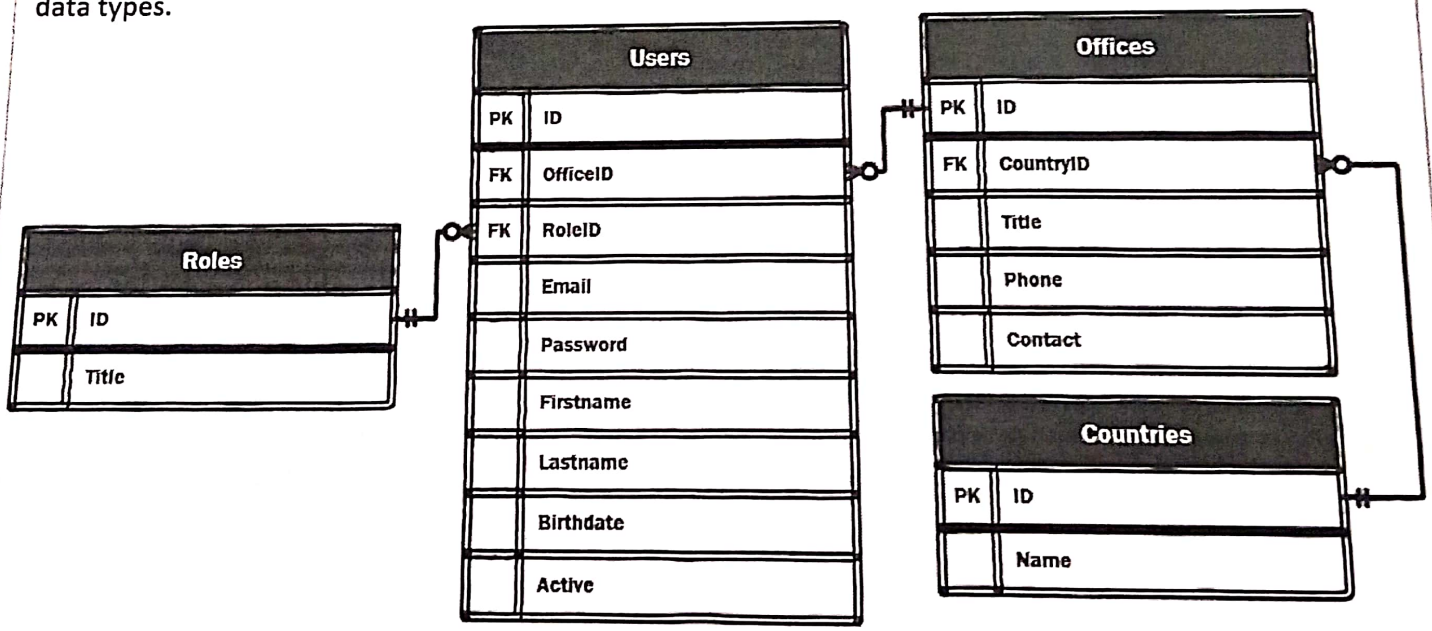
DELIVERABLES

1.1 CREATE THE DATABASE

Create a database by the name of "Session1" in your desired RDBMS Platform (MySQL or Microsoft SQL Server). This will be the main and only database you will use in this session.

1.2 IMPORTING DATABASE SATRUCTURE

Depending on your preferred RDBMS platform, a SQL scripts is made available. The said scripts consists of the database structure and data required to complete the required tasks. The data needs to be imported to the database created for this session named "Session1".
As instructed by the designers, the database structure provided for the purpose of this section cannot be altered. This applies to removal of tables, adding or deleting any fields on the tables or of change in their data types.



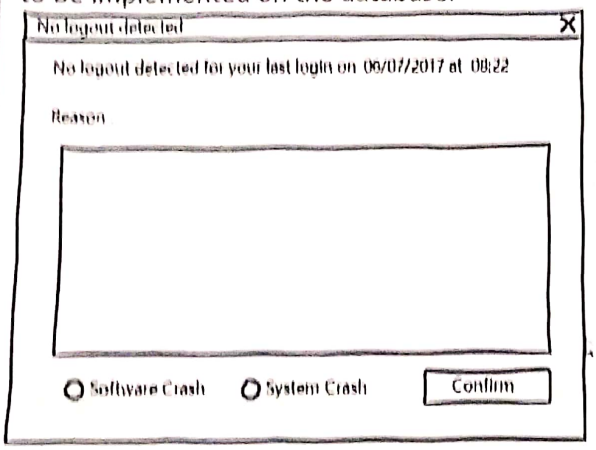
To help further perceive the thinking behind the structure of the database, the database designers provide an Entity-Relationship Diagram (ERD). The aforementioned diagram explains the conceptual and representational model of data used in the database.

1.3 IMPORT USER DATA

The management has approved a list of users that will need access to the system. The list that has been provided as "UserData.csv" needs to be imported into the "Users" table.
The list of the data fields that need to be imported and referenced against the database for each user are Role, Email, Password, First name, Last name, Title, Birthdate, and Active.
The password in the data files provided are clear text but for better security need to be converted to md5. From here on, all password should be stored in that same format. It goes without saying that since the e-mail address is being used as the username to log onto the system, it needs to be unique.

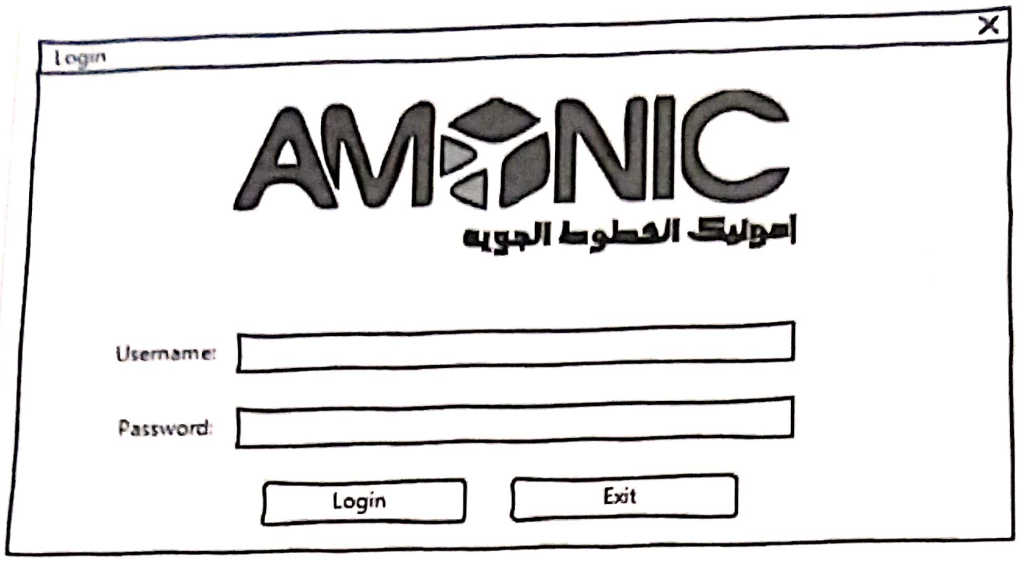
1.4 MONITORING OF USER ACTIVITY

Because of the security policy AMONIC Airlines has adapted, the company has asked for additional tracking implemented on the system. This requires analysis and development of additional table(s) which will need to be implemented on the database.



The goal of adding this option is to know how long each user is present on the system. This means that we need to keep records when someone enters the system and when they log off. The system also needs to be able to detect when something out of the ordinary happens and the user does not log off properly (e.g. the system crashes etc.). In those circumstances, the reason for the fault needs to be kept in the database so that the administrator can later review them and take actions to eliminate them. A mockup of the dialogue for this is shown above.

1.5 CREATE LOGIN SCREEN



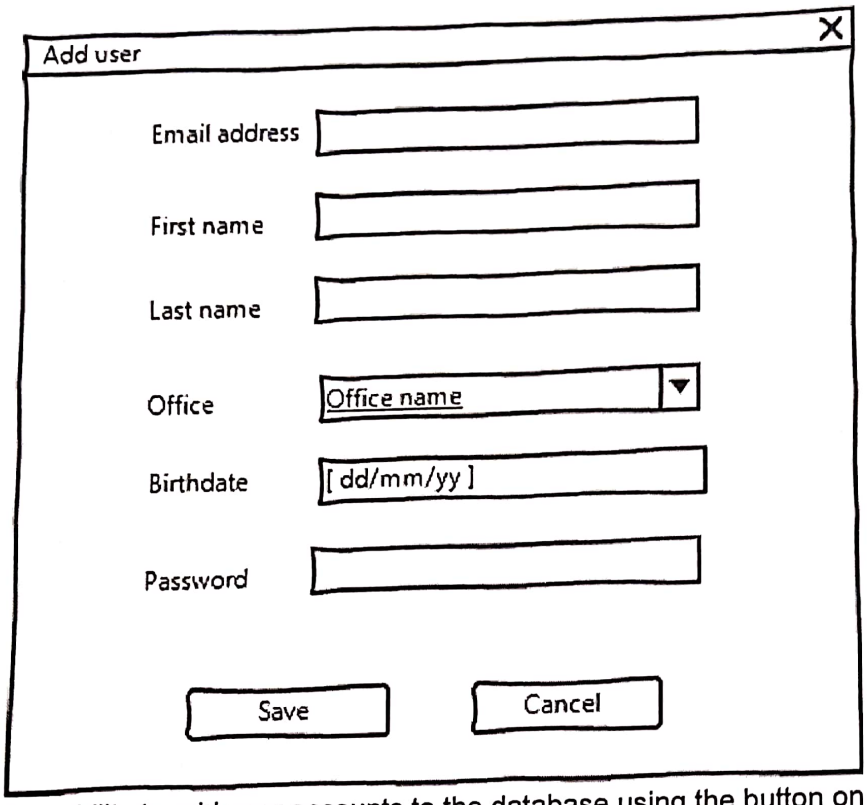
Create a login screen as shown above with the following characteristics:

- The Username is checked against the Email address in Users table
- If the client enters the wrong username or password for more than three times, they need to wait ten seconds before they can login to the system again. While waiting for the next chance to login, a countdown timer will indicate the time remaining for the next attempt.
- In case management disables the user and they enter the correct credentials, an appropriate message will let them know the reason why they cannot log on.
- Upon a successful attempt, based on the client's role, they will be directed to the main menu for either the administrator (item 1.6) or the user (item 1.7).

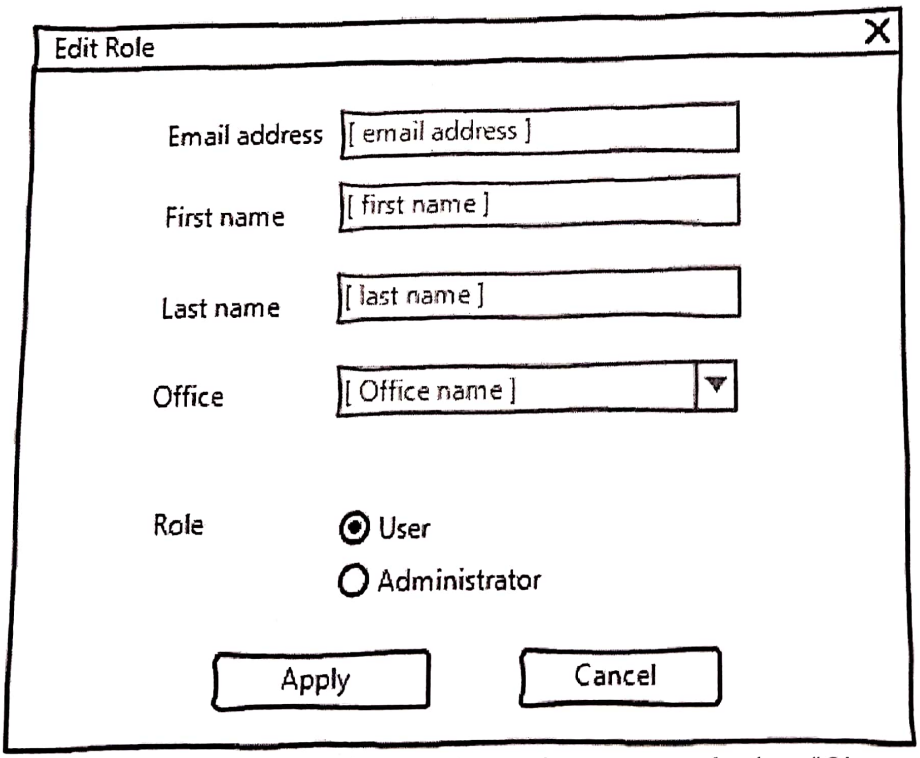
1.6 MAIN MENU FOR ADMINISTRATORS

The system administrator will have the following functionalities on their main screen:

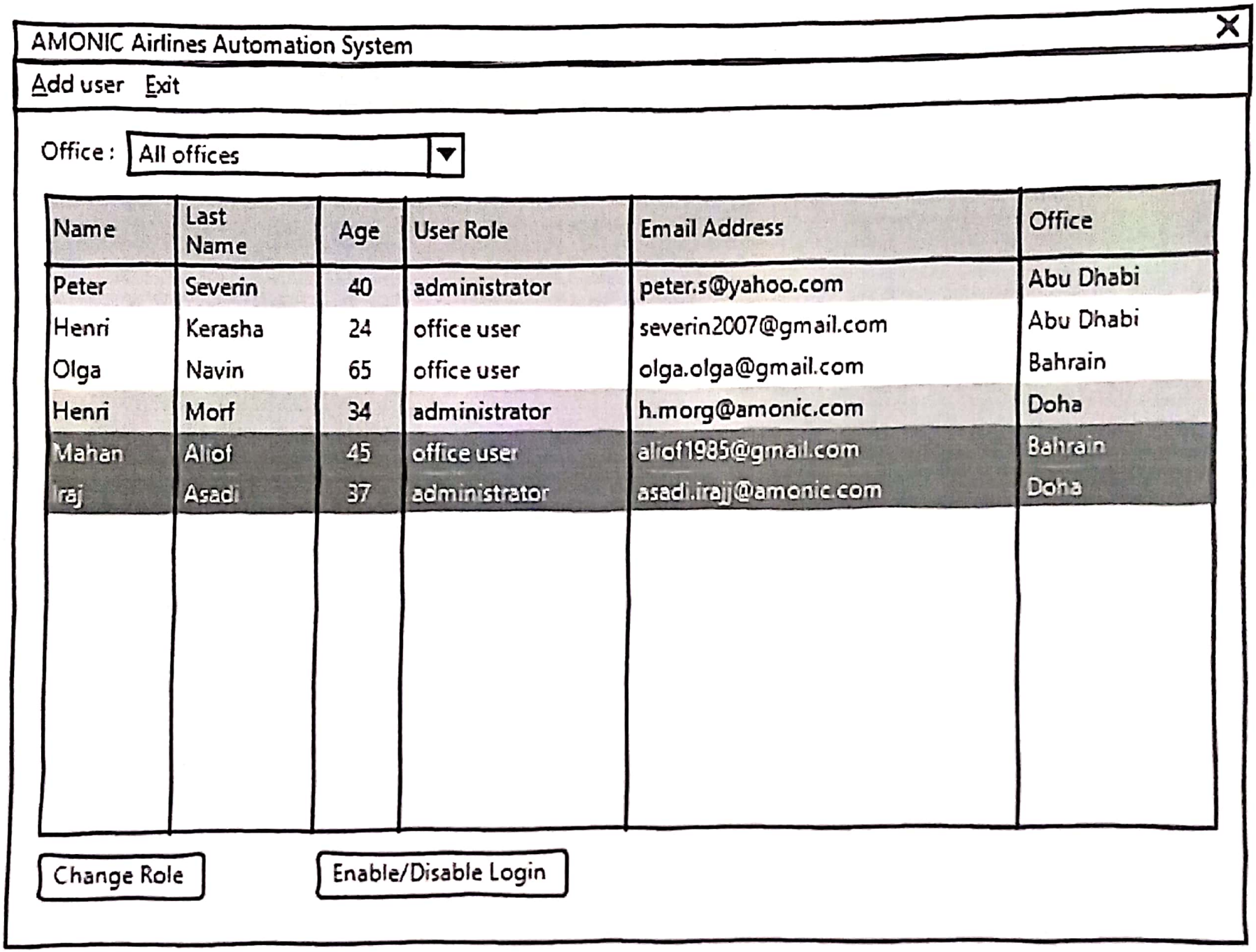
- Top menu which consists of "Add user", and "Exit"
- The list of the users on the system which is constructed as follows:
  - The list needs to have the name, family name, age, role, email address and the office they belong to
  - If the user on the list is disabled (suspended), they need to be set apart with different colour for backgrounds.
  - The age (in years) of each user should be calculated from the birthdate on the database and current to date set on the database server.
  - Using a drop-down menu or alike, the administrator would be able to display users based on the office they work at
- The administrator may want to suspend a user's access to the system temporarily. The way this part is mean to work is with a button on the bottom of the form that toggles between "Suspend Account" for enabled users and "Unsuspend Account" for disabled accounts.
- All operations on this form need to be done in real-time and without the need to close the form and reopen it.



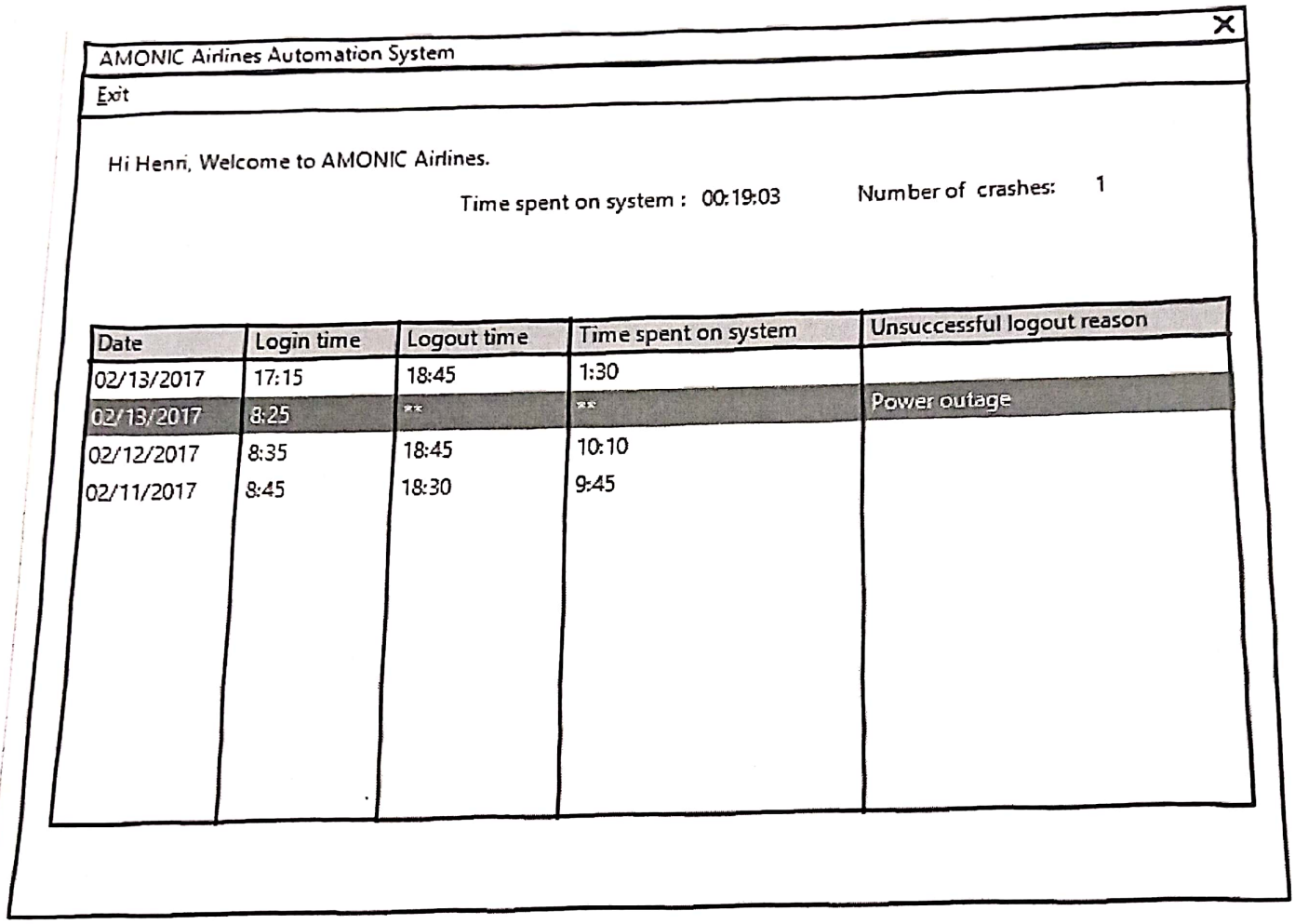
- The ability to add user accounts to the database using the button on the top menu as shown on the wireframe diagram drawn above:
  - All fields need to be filled in
  - The administrator does not have the ability to add other administrator accounts



- Using the button at the bottom of the main menu marked as "Change Role" the administrator would be al to change the access level of the selected users. A mockup of the form is drawn above.



1.7 MAIN MENU FOR USERS



When a user successfully enters the system, they will have the following options to work with:

- Top menu which consists of "Exit".
- The welcome message as indicated on the image above:
  - [fullname]: The username of the clients logged on to the system
  - [hh:mm:ss]: Total time that the current user has spent system in the last 30 days
  - [n]: Number of the crashes the software system has on record for the user

  Hi [fullname], Welcome to AMONIC Airlines Automation System
  Time spent on system: [hh:mm:ss]
  Number of crashes: [n]
- The list of user's activities which consists of the following:
  - The columns to be displayed are date and time of logging on and off as well as the total time one has spent on the system.
  - If there is a crash detected, the reason needs to be displayed in the appropriate column. The row that relates to the crash needs to be contrasted with a different background color.
  - The last login to the system which is the one used to get to this form is not displayed on the form.

MODULE 2

This part of the Test Project uses the following documentation/files:

1. WSC2017_TP09_M2_actual.pdf (Session 2 instructions)
2. Session2-MySQL.sql (SQL Script to create tables with data for MySQL)
3. Session2-MsSQL.sql (SQL Script to create tables with data for Microsoft SQL)
4. Schedules_V12.csv (Schedule changes)
5. Schedules_V12_2.csv (Schedule changes)

INTRODUCTION

One of the vital functionalities of any software solution provided to an airline is the ability to schedule flights and manage their status. AMONIC Airlines is no different in asking for a system that fits their needs. The tasks described in this document are as follows:

- Apply schedule changes using the provided files
- Provide an interface to view and manage the schedules

DURATION OF MODULE

3 hours only

DESCRIPTION OF PROJECT AND TASKS

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Time management is critical to the success of any project and so it is expected of all deliverables to be complete and operational upon delivery.

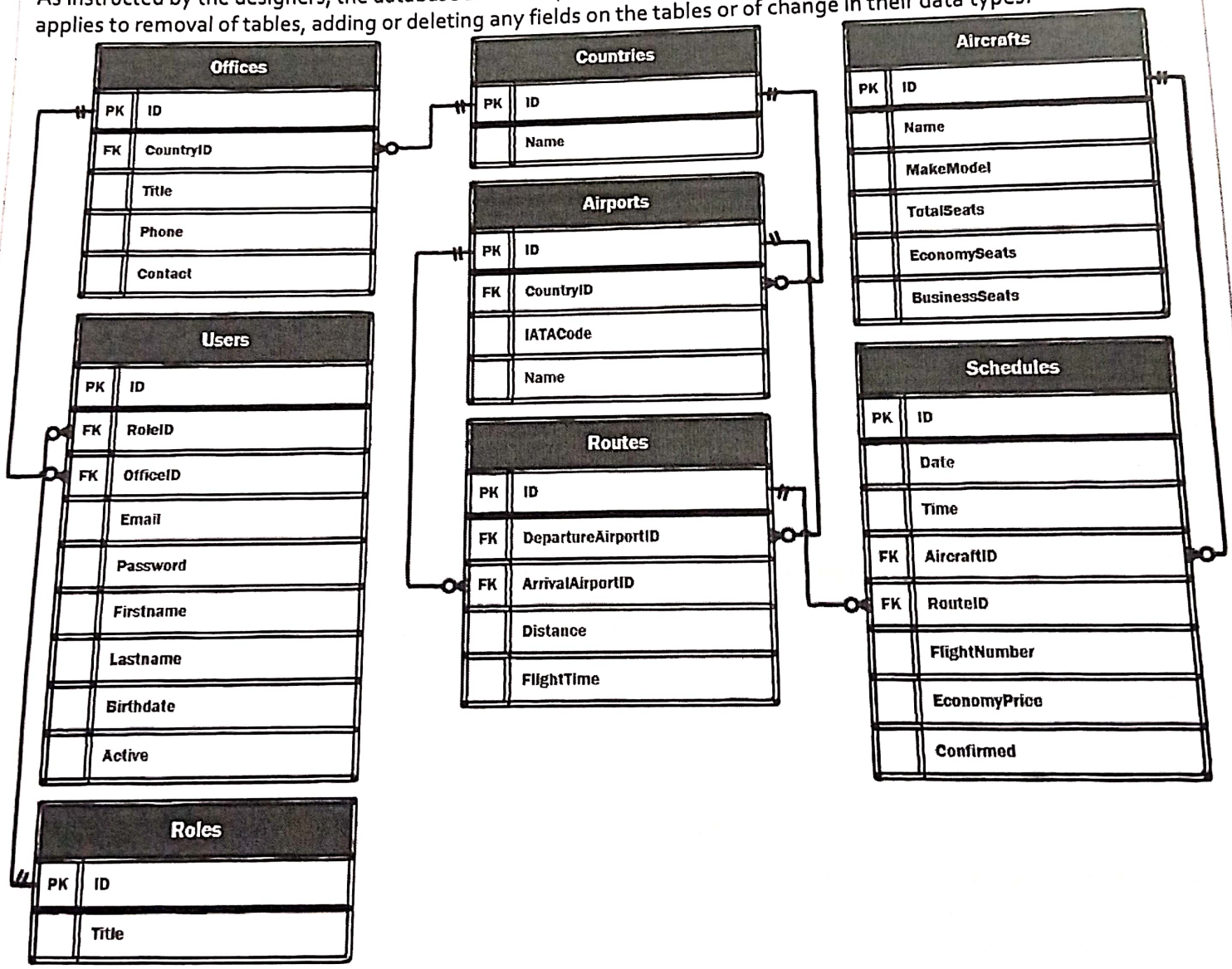
DELIVERABLES

2.1 CREATE THE DATABASE

Create a database by the name of "Session2" in your desired RDBMS Platform (MySQL or Microsoft SQL Server). This will be the main and only database you will use in this session.

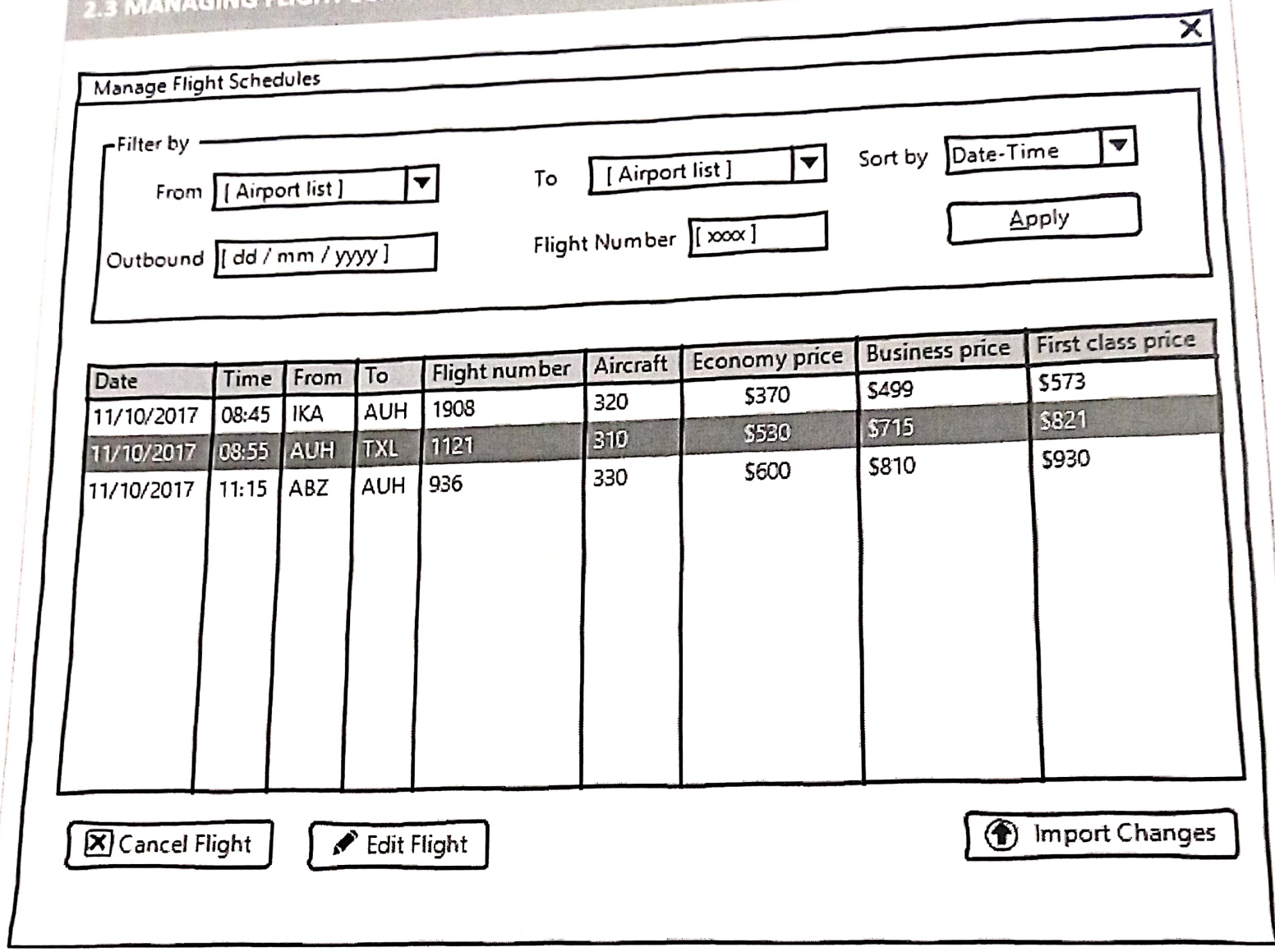
2.2 IMPORTING DATABASE STRUCTURE

Depending on your preferred RDBMS platform, a SQL scripts is made available. The said scripts consists of the database structure and data required to complete the required tasks. The data needs to be imported to the database created for this session named "Session2".
As instructed by the designers, the database structure provided for the purpose of this section cannot be altered. This applies to removal of tables, adding or deleting any fields on the tables or of change in their data types.



To help further perceive the thinking behind the structure of the database, the database designers provide an Entity-Relationship Diagram (ERD). The aforementioned diagram explains the conceptual and representational model of data used in the database.

2.3 MANAGING FLIGHT SCHEDULES

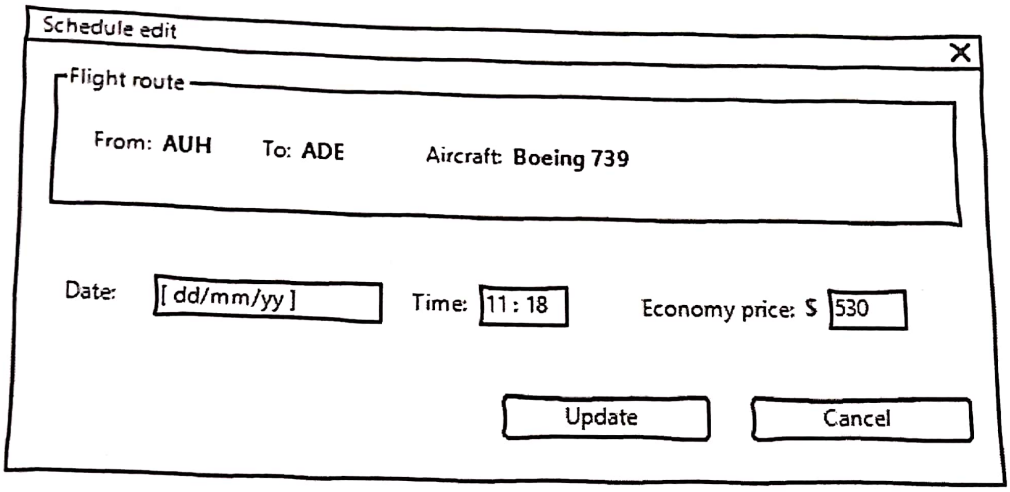


The management at the airlines has requested a form to facilitate the basic ability to view, edit and cancel flights. The following list defines the functionalities requested for the form:

- *Search based on departure airport and arrival airport (they cannot be the same). Also searching for flights based on the date of departure and flight number should be included. The manager should be able to mix and match to their liking so they should be able to include or exclude any of the criteria at any time or no criteria at all (the default).*
- *The ability to sort the list descending by the one of the criterion of date and time, price for economy flights and whether they are confirmed or not. The default should be set on date and time.*
- *The list of flights scheduled on the system which is constructed as follows:*
  - *The list needs to include the date, time, departure airport, arrival airport, flight number, aircraft type and prices for economy, business and first class seats.*
  - *The price of business class seats has 35% premium over economy and first class flights are 30% more expensive than those of business class seats. In case you don't come up with rounded numbers you can round the numbers down to their nearest whole number.*

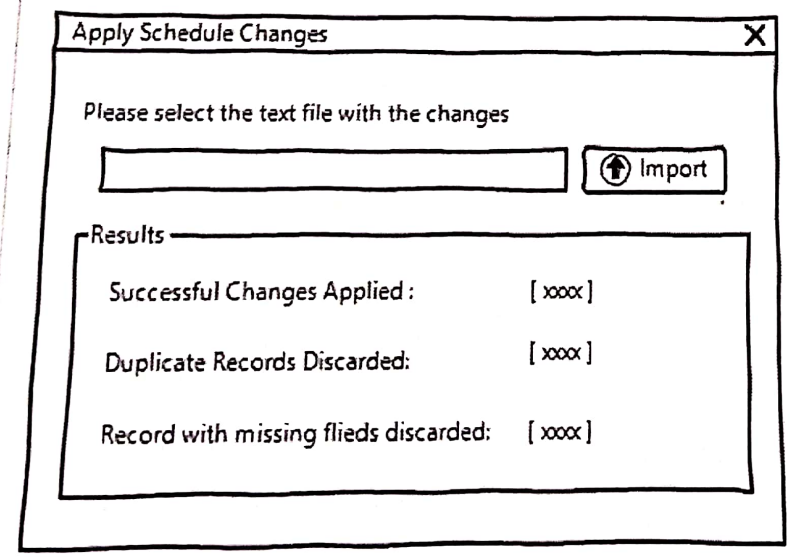
- If a flight is marked as cancelled (not confirmed), the row corresponding to the flight should be marked with a different background color.

- Using a button on the form, the manager can toggle between "Cancel Flight" and "Confirm Flight" for the selected flight on the list. By cancelling a flight, you will set the corresponding record on the database to not confirmed.



- By selecting an item from the flight schedule list and using a button on the form, one would be able to change the date, time and the price for seats in the economy class as shown above.
- All operations on this form need to be done in real-time and without the need to close the form and reopen it.

2.4 APPLYING FLIGHT SCHEDULE CHANGES



At the end of each working day, the management of all AMONIC Airlines offices hold meetings to review the flight schedules and to make changes if required. This mean they might want to submit cancellations, changes or even add flights to the registered schedules on the system.

The way this works is at the end of every meeting, an associate will produce a text file detailing all needed changes and submit it to the IT consultants. The consultants will then apply those changes through an interface on the solution provided.

Please consider the following to complete this task:

- The data provided in order of their field list are operation, departure date, departure time, flight number, IATA code of departure airport, IATA code of arrival airport, aircraft code, base price and confirmation.
- Type of operation as set in the provided files are as follows:
  - ADD: Add a new record that represents the values on the record.
  - EDIT: If the record is found in the database it should be changed with the new values.
- Confirmation field in the data provided is either set to "OK" which are the flights that are confirmed or "CANCELLED" which refers to the ones that have to be set to not confirmed in the system.
- Flights are identified by their flight number and departure date. Should the user accidentally import the same record twice, the system must omit the duplicate flights and report them back to the user.
- All the fields in the "Schedules" table that needs to be changed are required. Which means, in case of a record with any missing fields, they should not be added to the database. The results section should reflect the number of discarded rows.

MODULE 3

PART 3 of the Test Project consists of the following documentation/files:

1. WSC2017_TP09_S3_EN.pdf (Session 3 instructions)
2. Session3-MySQL.sql (SQL Script to create tables with data for MySQL)
3. Session3-MsSQL.sql (SQL Script to create tables with data for Microsoft SQL)

INTRODUCTION

As part of their automation system, AMONIC Airlines is asking to implement a ticketing system to operate out of their offices. To reserve a ticket with AMONIC Airlines, the would-be passengers can either call one of the airlines' offices or walk into one of their locations and provide the required details.

The following are the main functionalities of the session:

- Search for flights and find the flight to fit the needs of the passengers.
- Issue tickets based on the details provided by the client.

DESCRIPTION OF PROJECT AND TASKS

In submitting your solution, please make sure the deliverables conform to the basic guidelines drawn out by different departments at AMONIC Airlines:

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DURATION OF MODULE

3 hours only

DELIVERABLES

3.1 CREATING THE DATABASE

Create a database by the name of "Session3" in your desired RDBMS Platform (MySQL or Microsoft SQL Server). This will be the main and only database you will use in this session.

3.2 IMPORTING DATABASE STRUCTURE

Depending on your preferred RDBMS platform, a SQL scripts is made available. The said scripts consists of the database structure and data required to complete the required tasks. The data needs to be imported to the database created for this session named "Session3".
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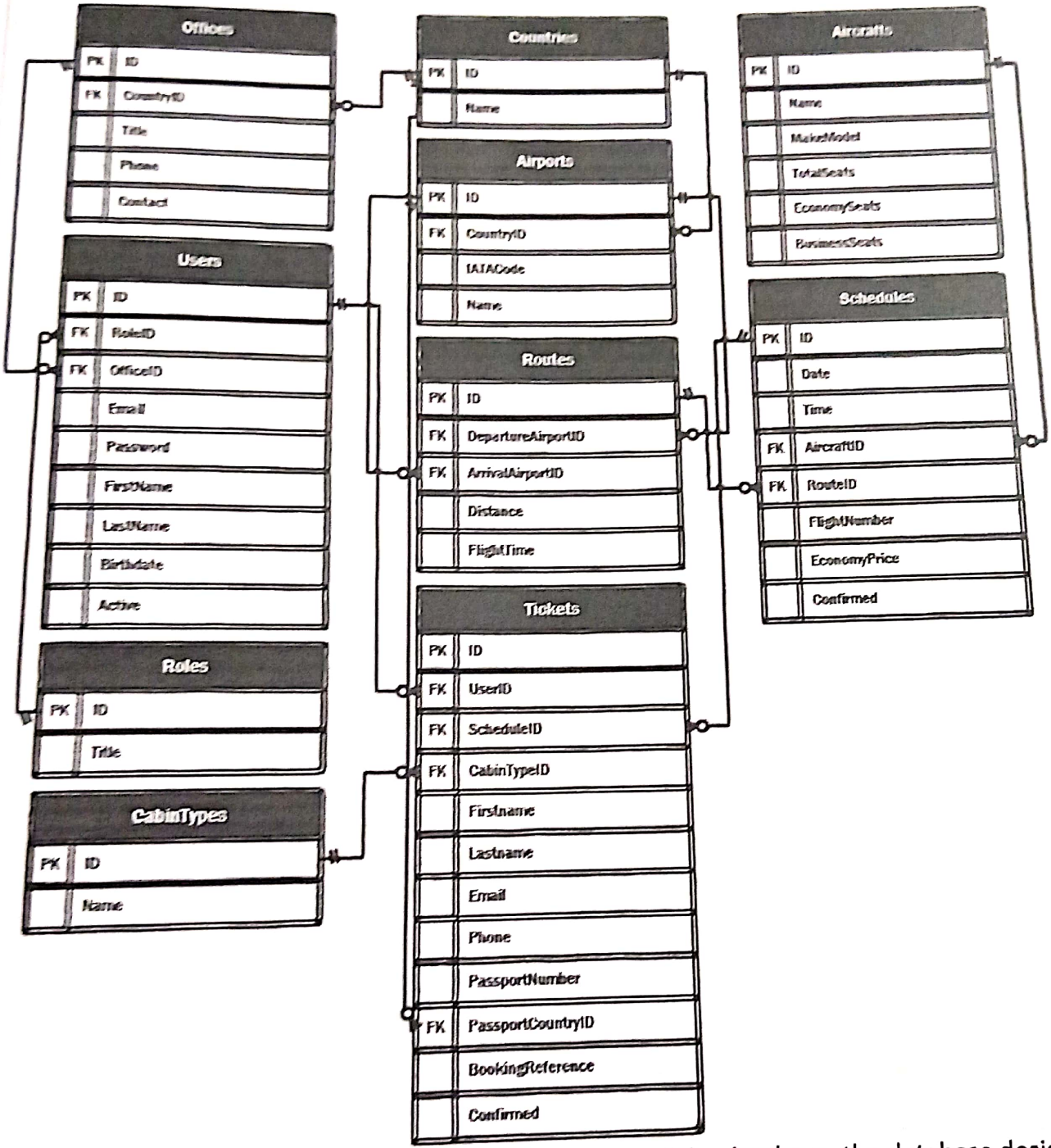

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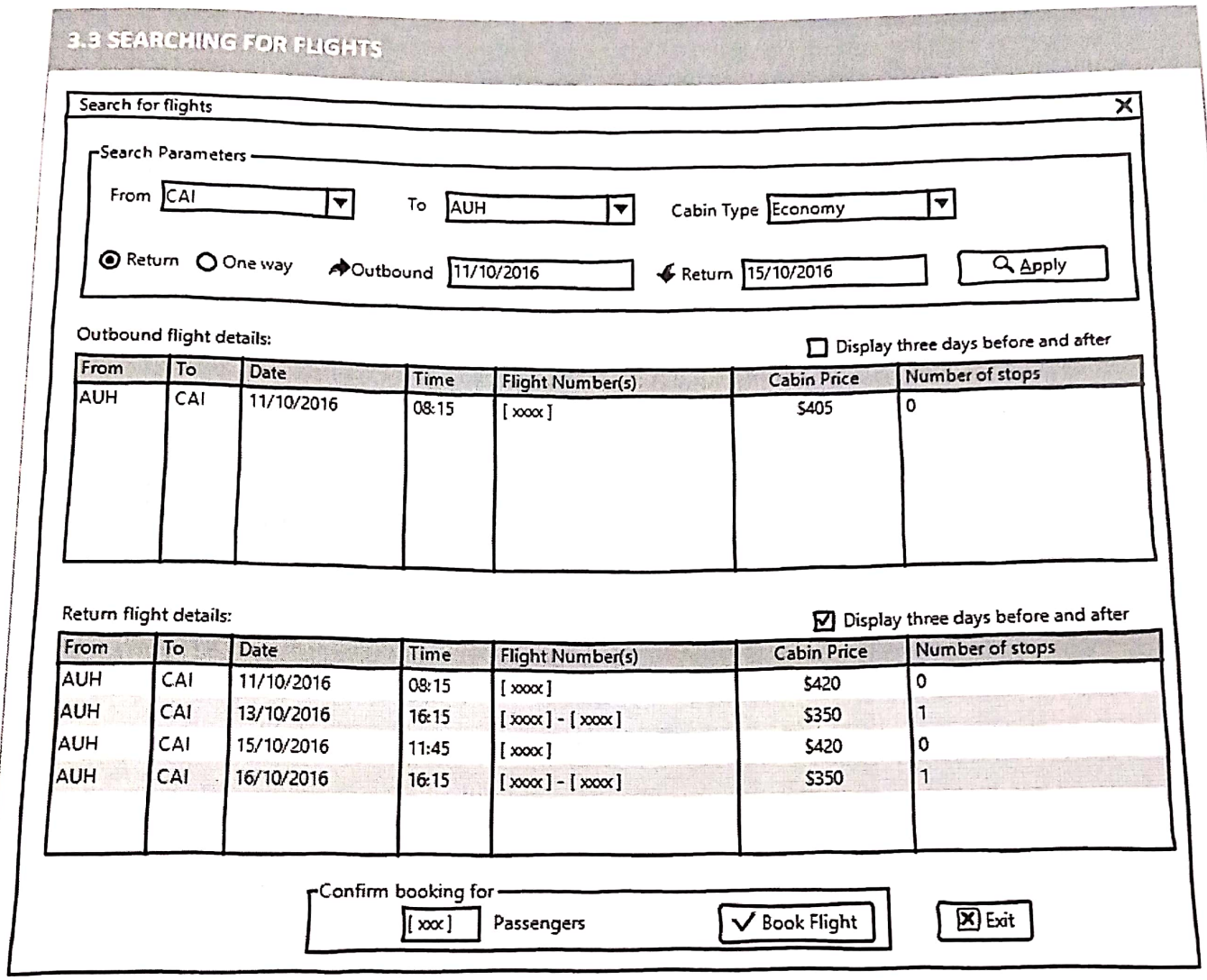
3.3 SEARCHING FOR FLIGHTS



In order to book a flight, the system operator needs to find out if there are flights on schedule for that the passenger needs.

In order to find the correct flight, the operator can fill in some or all of the following parameters:

- The departure and arrival airports combo boxes must be put on the form that list the airports we have services to.
- The outbound date is required. Should the passenger choose to get return tickets, they can then choose a return date as well.
- There is an option for when the passenger gets to choose either tickets for a one-way booking or return tickets as part of the booking as well. The return tickets need to have the same departure and arrival airports but in reverse. The return flight can only be booked for dates after that of the outbound tickets.
- Cabin type, which affects the price of the ticket, needs to be included as a parameter in the form of a combo box. The default cabin type is set to "Economy".

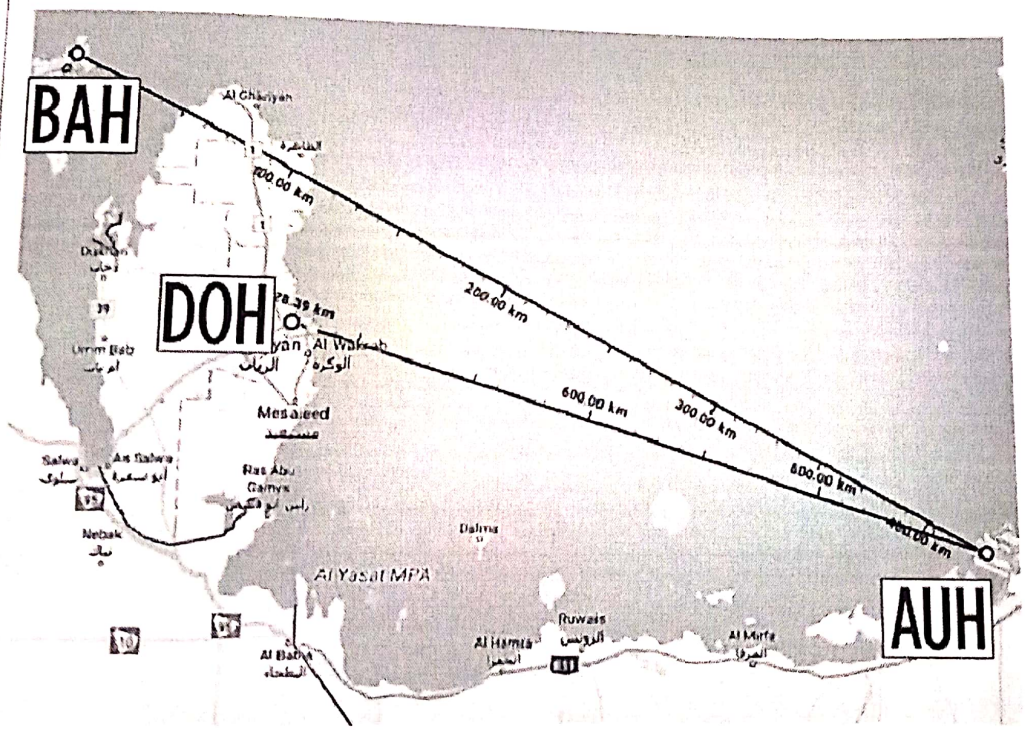
Once the flight criterion is set, a list (two lists if the user asks for return flights) will be shown which are characterized as follows:

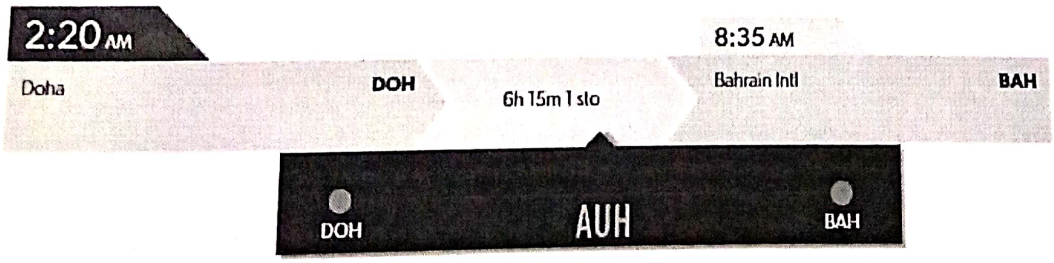
- The list with the outbound flights needs to be on the screen at all times even if there are no results. The list corresponding to return flights will only be shown to the user when the user chooses to book a return flight.
- By using a checkmark above each of the lists, the user can choose to have the booking system look for flight three days before and after the specified date. This is to eliminate to need to have to search multiple times to find similar results.
- The items on the list include the departure airport (From), arrival airport (To), date and time of departure, flight number or flight numbers if there are stops on the way.
- The price of business class seats has 35% premium over economy and first class flights are 30% more expensive than those of business class seats. In case you do not come up with rounded numbers you can round the numbers down to their nearest whole number.

Upon selecting the flight or flights, the user will confirm the number of passengers that want to book the same path and confirm their booking. The system will then look to see if there are enough seats on the picked flights for the passengers. If so, they will be able to proceed to the booking confirmation form.

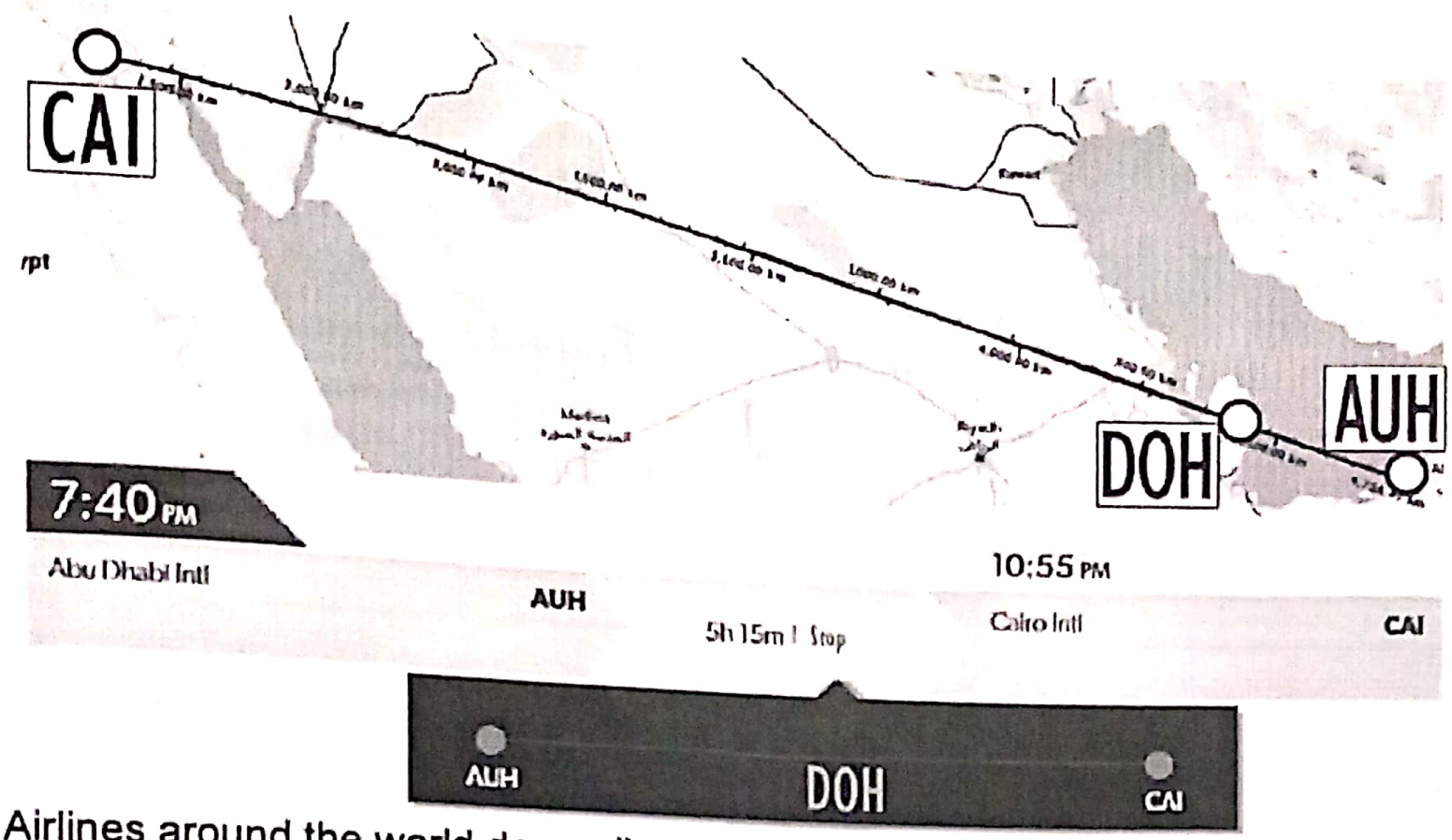
Please consider the following in order to better understand how the booking system behaves:

- AMONIC Airlines has limited flights to destinations in its region of operation. At times, passengers might want to book flights that the airline does not have direct flights to.



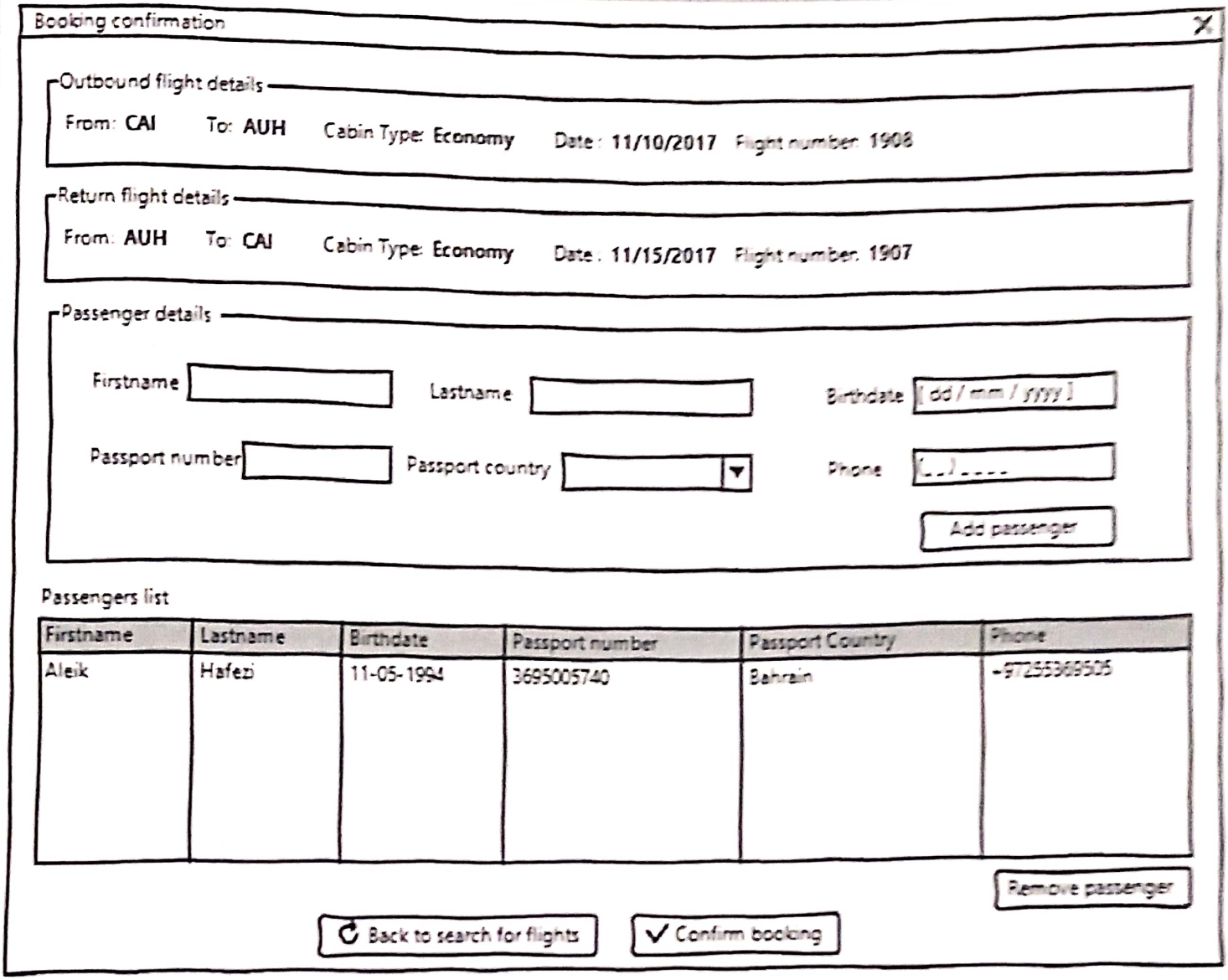


- Consider the flight on the picture above. Since we do not have a direct flight from Doha to Bahrain, we offer our passengers the DOH-AUH-BAH route indirectly through Abu Dhabi (our main hub). Your system should be able to find and offer booking based on all routes available.



- Airlines around the world depending on their routes and how well they are received, can choose to have stopovers. This will help with the costs and make the routes and flights financially viable. They are called indirect flights.
  As shown above, the AUH-CAI route on its own has not attracted as much interest to warrant for as many flights but when we do have a stop in Doha, we can offer our services to AUH-DOH flyers as well as people who want to fly DOH-CAI. To summarize, our booking system in these situations will offer the route AUH-CAI but in order to do so, it will issue two tickets for the routes AUH-DOH and DOH-CAI. Of course we do still have direct flights on that same route on some days of the week as well.

3.4 BOOKING CONFIRMATION

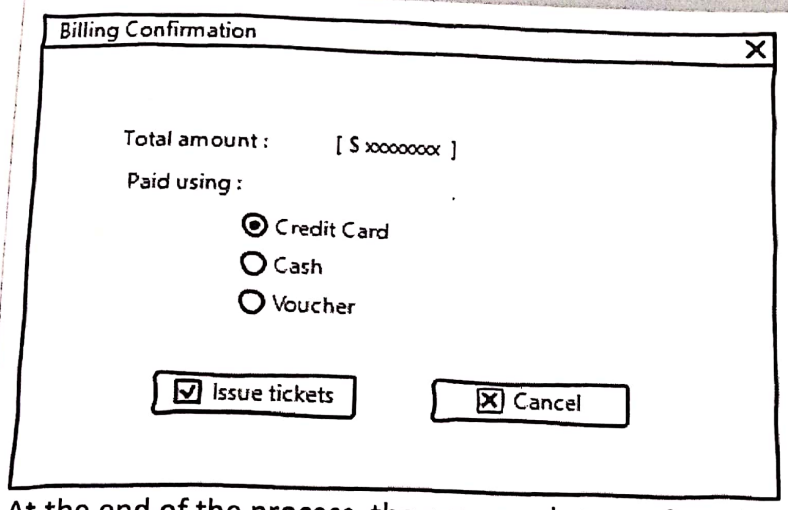


Once the flights for the booking have been selected, the booking confirmation form appears where the operator can enter details of the passengers flying on the booking.

This form should include the following:

- Details of the flight or flights for both the outbound flight and the return flights.
  - If there's no return flight selected then there's no need to show return flight information.
  - If there are multiple flights for outbound or return flights, those information need to be displayed as well.
- Passenger information to add booking for:
  - The fields required to add someone are first name, last name, birthdate, passport number, passport country, and phone number.
  - The passport country should be a combo box listing all the countries in the database.
  - Entering all passenger information requested are mandatory to register a booking.
- By clicking a button to add booking for the passenger, their details needs to be added to a list. The user then cannot edit any of the records but they can remove them by using a remove button.
- When the details are finalized, the "Confirm booking" button will take the user to the billing confirmation dialogue.

3.5 BILLING CONFIRMATION



At the end of the process, the user needs to confirm that they have received the total amount. The details of what this form needs to have are the following:

Calculate the total amount payable, which is the sum of the total price of all the tickets that are going to be issued as part of this booking.

The ability to choose between credit card, cash or voucher as payment method. This information will not be stored anywhere at this phase of the solution.

The confirmation button which is labelled as issue tickets in the picture above will in turn issue all the tickets and store them in the database:

- For every passenger on each flight, a correspondent record needs to be stored in the database.
- To differentiate between each booking, which consists of one or a number of flights for every person, booking reference is actively used in the industry. Booking reference is a string made of six alphanumerical characters. This string of characters needs to be unique and cannot be shared between bookings.
- When issuing multiple tickets for a single booking, a booking reference number is generated and set on all the tickets.

The cancel button will close this form and return the user to booking confirmation.

MODULE 4

PART 4 of the Test Project consists of the following documentation/files:

1. WSC2017_TP09_S4_EN.pdf (Session 4 instructions)
2. SurveyResults_05_2017.csv (Survey Results for May 2017)
3. SurveyResults_06_2017.csv (Survey Results for June 2017)
4. SurveyResults_07_2017.csv (Survey Results for July 2017)
5. SampleSurveyForm.pdf (Sample survey form for reference)

INTRODUCTION

Customer satisfaction surveys help you identify the overall level of satisfaction and assist with finding your happiest and unhappiest customers. Feedback from a survey gives you the opportunity to follow up with your happiest customers (to turn them into advocates), and your unhappiest customers (to fix problems and retain their business).

AMONIC Airlines has been using customer satisfaction surveys since May of 2017 to optimize its services. The surveys are now brought together and the company needs a solution to create some reports from them.

In this section the main tasks asked for are as follows:

- Create the database and make any tables needed to import survey data.
- Make a summary report to characterise the data present in the database.
- Create and display a detailed report with charts to visualise the data.

DESCRIPTION OF PROJECT AND TASKS

In submitting your solution, please make sure the deliverables conform to the basic guidelines drawn out by different departments at AMONIC Airlines:

- There needs to be consistency in using the provided style guide throughout your work
- All software modules asked for, must have applicable and useful validation and error messages as is expected in the industry.
- Any form or report created, once in focus needs to be displayed in the centre of the screen.
- When a form or a dialogue is in focus, operations on other forms need to be suspended.
- The caption of Delete and Cancel buttons need to be in red to help with accidental mishaps.
- When using colours to differentiate between rows or records, there needs to be visible clarification on the screen as to what they stand for.
- The wireframe diagrams provided as part of this document are only suggestions and the solution produced should not in any way mirror what has been pictured.
- Time management is critical to the success of any project and so it is expected of all deliverables to be complete and operational upon delivery.

DURATION OF MODULE

3 hours only

DELIVERABLES

4.1 CREATING THE DATABASE

Create a database by the name of "Session4" in your desired RDBMS Platform (MySQL or Microsoft SQL Server). This will be the main and only database you will use in this session.

4.2 CREATING THE DATABASE STRUCTURE

Depending on your preferred RDBMS platform, you will need to make the data structure needed to complete the task. This entails making the tables and linking the tables to make it normalized as required. The raw data provided are representative of the sample survey name "Sample Survey Form". Here is your guide to the provided data:

- The data is compiled in a single file in csv format at the end of each month. The data file is then submitted to the software developer to generate reports. Since this is the first time we are trying to generate, the files for the last three months are produced.
- Here is how the associations between the data files and the survey data form:

QUERY CODE IN THE SUMMARY FILE (CSV)	THE TEXT OF THE QUERY
Q_1	Please rate our aircraft flown on AMONIC Airlines
Q_2	How would you rate our flight attendants
Q_3	How would you rate our inflight entertainment
Q_4	Please rate the ticket price for the trip you are taking

- Based on the filled out forms the values that are assigned to each of the items listed as ratings are as follows:

VALUE IN DATA	VALUE IN THE DATA
1	Outstanding
2	Very Good
3	Good
4	Adequate
5	Needs Improvement
6	Poor

7	Don't know

- If the participants in the survey do not choose to answer any of the queries and they are left blank a value of 0 is saved for their column.
- The form also asks for people to let the airline know more about who they are. As this is an anonymous survey, only a passive inquiry is made.
  - The fields asked for as shown in the sample survey are gender, age, their flight path (departure and arrival airports) and their cabin type. All the fields provided need to be present in the database and can be asked on each report if they are there on the mockups.
  - As it is common with customer surveys, the survey participants may choose to omit their personal information. The data collected will have blank fields under the column in which the passengers choose not to answer.

Flight Satisfaction Survey Reports

View Results Summary View Detailed Results Exit

Fieldwork: June 2017 - October 2017

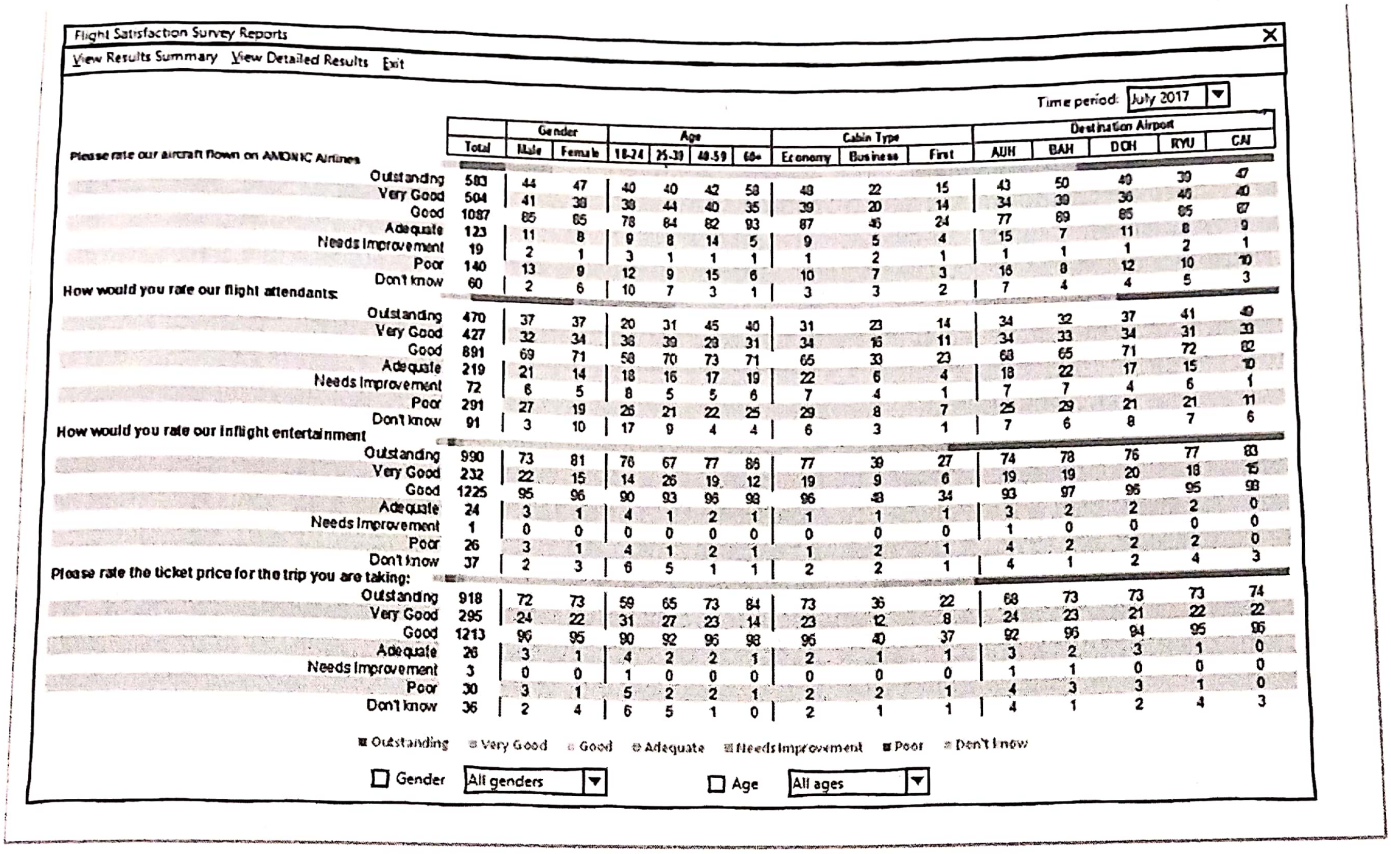
Sample Size: 1727 Adults

Gender		Age				Cabin Type			Destination Airport				
Male	Female	18-24	25-39	40-59	60+	Economy	Business	First	AUH	BAH	DOH	RYU	CAI
839	888	209	440	590	487	984	372	300	221	561	370	425	150

4.3 GENERATING SUMMARY RESULTS

The initial form the management needs to view is the summary report. On this form, the following pieces of information are made available:

- The top menu which the option to view detailed report and to exit this part of the application.
- Fieldwork which states the results from which months are currently available in the database.
- Sample size is the total number of records on the database
- Summary of all the results per each of the groups and categories included in the survey:
  - To classify participants based on their age, they are arranged into four levels that are important to the airline. The 18-24 age group, the 25-39, the 40-59 and finally the 60+.



	Total	Gender		Age				Cabin Type			Destination Airport				
		Male	Female	18-24	25-39	40-59	60+	Economy	Business	First	AUH	BAH	DOH	RYU	CAI
Please rate our aircraft flown on AMONIC Airlines															
Outstanding	583	44	47	40	40	42	58	48	22	15	43	50	40	39	47
Very Good	504	41	39	39	44	40	35	39	20	14	34	39	36	46	40
Good	1087	85	85	78	84	82	93	87	45	24	77	89	85	85	87
Adequate	123	11	8	9	8	14	5	9	5	4	15	7	11	8	9
Needs Improvement	19	2	1	3	1	1	1	1	2	1	1	1	1	2	1
Poor	140	13	9	12	9	15	6	10	7	3	16	8	12	10	10
Don't know	60	2	6	10	7	3	1	3	3	2	7	4	4	5	3
How would you rate our flight attendants:															
Outstanding	470	37	37	20	31	45	40	31	23	14	34	32	37	41	40
Very Good	427	32	34	38	39	28	31	34	16	11	34	33	34	31	33
Good	891	69	71	58	70	73	71	65	33	23	68	65	71	72	62
Adequate	219	21	14	18	16	17	19	22	6	4	18	22	17	15	10
Needs Improvement	72	6	5	8	5	5	6	7	4	1	7	7	4	6	1
Poor	291	27	19	26	21	22	25	29	8	7	25	29	21	21	11
Don't know	91	3	10	17	9	4	4	6	3	1	7	6	8	7	6
How would you rate our inflight entertainment															
Outstanding	990	73	81	76	67	77	86	77	39	27	74	78	76	77	83
Very Good	232	22	15	14	26	19	12	19	9	6	19	19	20	18	15
Good	1225	95	96	90	93	96	98	96	48	34	93	97	96	95	98
Adequate	24	3	1	4	1	2	1	1	1	1	3	2	2	2	0
Needs Improvement	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Poor	26	3	1	4	1	2	1	1	2	1	4	2	2	2	0
Don't know	37	2	3	6	5	1	1	2	2	1	4	1	2	4	3
Please rate the ticket price for the trip you are taking:															
Outstanding	918	72	73	59	65	73	84	73	36	22	68	73	73	73	74
Very Good	295	24	22	31	27	23	14	23	12	8	24	23	21	22	22
Good	1213	96	95	90	92	96	98	96	40	37	92	96	94	95	96
Adequate	26	3	1	4	2	2	1	2	1	1	3	2	3	1	0
Needs Improvement	3	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Poor	30	3	1	5	2	2	1	2	2	1	4	3	3	1	0
Don't know	36	2	4	6	5	1	0	2	1	1	4	1	2	4	3

4.4 GENERATING DETAILED RESULTS

The detailed report generated, will help the user view the total results and to customize it to fit their needs. Here are some characteristics of the report to consider:

- Each query or question has seven possible outcomes and they need to be itemized for better clarity.
    - To improve readability different colors are used as background for odd and even rows.
- The report also needs different columns for each category of the personal information gathered like gender, age, destination (arrival) airport, and cabin type.
    - To classify participants based on their age, they are arranged into four levels that are important to the airline. The 18-24 age group, the 25-39, the 40-59 and finally the 60+
- The total of all the columns or categories displayed on the report is shown at the very left side.
- Because the surveys are handed over monthly, the management has asked to be able to evaluate performance over time. As shown on the picture a combo box can be used to generate reports based on time periods (in months). There should also be an option in the combo box to have this filter disabled so that records from all the dates in the database are included in the report.
- The management also needs to generate reports with different categories and group of categories. For example if they want to know how male correspondence between the ages of 18-24 without any preference on their cabin type think about one of the queries, they can use this component to do that. The suggestions of the IT department to implement this functionality are listed below:
    - As pictured, the user can use combo boxes for gender and age groups with the categories listed under them and check marks next to them.

- If the user does not need the group displayed or affect the totals, they can use the checkmark positioned next to the combo boxes to have them removed.
- It goes without saying that the combo box corresponding to the two groups of categories needs to be disabled and the columns removed on the report in case they are taken out (the check mark removed) of the report.
- The combo box should include an option that using, one can include all the categories or columns in the report.
- If one of the categories is selected, the other columns will not be shown on the report and they will not count in the totals.
- By default and upon initiation of the form, all the checkmarks are enabled (all groups and columns are displayed) and the combo boxes are set to display all the categories.

- Create a stacked bullet graph for each query or question with the following specifics:
  - The said graph is recommended to be placed on the row in front of each query or question.
  - The data used to draw, is based on the total for each rating for the said question.
  - There's no preference of what colors are used to represent each of the ratings but there needs to be a legend placed at the bottom of the report to indicate how they are associated.

MODULE 5

PART 5 of the Test Project consists of the following documentation/files:

1. WSC2017_TP09_S5_EN.pdf	(Session 5 instructions)
2. Session5-MySQL.sql	(SQL script to create tables with data for MySQL)
3. Session5-MsSQL.sql	(SQL script to create tables with data for Microsoft SQL)
4. CaseStudy.pdf	(Case study provided by a department of the airline)
5. TestingTemplate.docx	(Testing template to be completed for session 5)
6. ReservationSystem.exe	(Working copy of the reservation system)

INTRODUCTION

In order to improve flight experience on AMONIC Airlines and provide a better experience, the airline has decided to offer some amenities to passengers.

There will also be requests for diagrams and technical testing of the reservation system as provided.

The following are the main functionalities executed in this session:

- Allow the passengers to purchase amenities.
- Create reports based on flight numbers and flight dates.
- Test a working copy of a software and provide a report of the results based on provided queries.
- Provide diagrams for the analysis of the case study provided.

DESCRIPTION OF PROJECT AND TASKS

In submitting your solution, please make sure the deliverables conform to the basic guidelines drawn out by different departments at AMONIC Airlines:

- There should be consistency in using the provided style guide throughout development.
- All required software modules must have applicable and useful validation and error messages as expected by the industry.
- The use of valid and proper naming conventions is expected in all material submitted.
- Any form or report once created should be displayed in the centre of the screen.
- When a form or a dialogue is in focus, operations on other forms need to be suspended.
- The caption of Delete and Cancel buttons need to be in red to help with accidental mishaps.
- When using colours to differentiate between rows or records, there needs to be visible clarification on the screen as to what they stand for.
- The wireframe diagrams provided as part of this document are only suggestions and the solution produced does not have to be, in any way, mirror what has been pictured.
- Time management is critical to the success of any project and so it is expected of all deliverables to be complete and operational upon delivery.

DURATION OF MODULE

3 hours only

DELIVERABLES

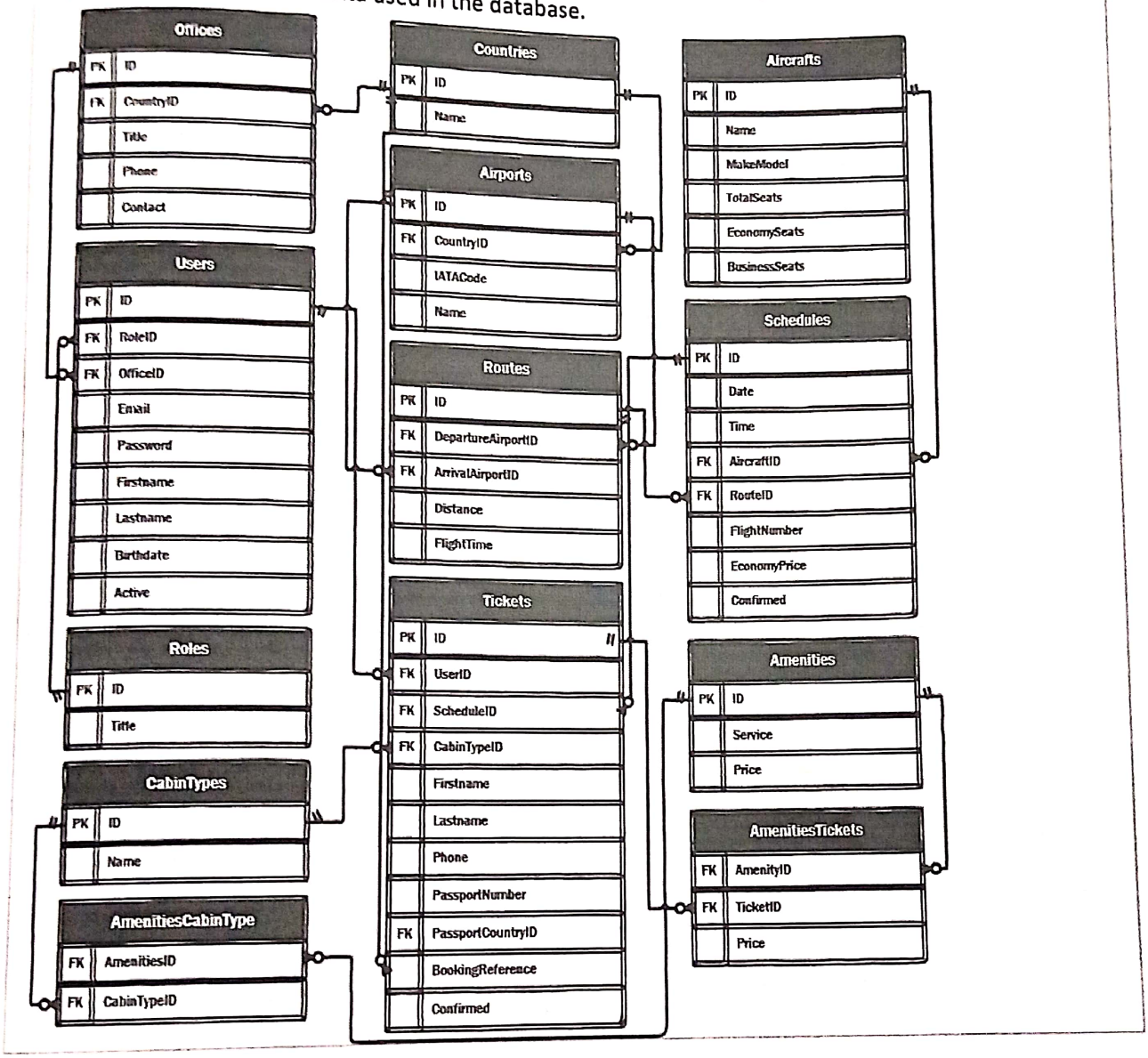
5.1 CREATING THE DATABASE

Create a database by the name of "Session5" in your desired RDBMS Platform (MySQL or Microsoft SQL Server). This will be the main and only database you will use in this session.

5.2 IMPORTING DATABASE STRUCTURE

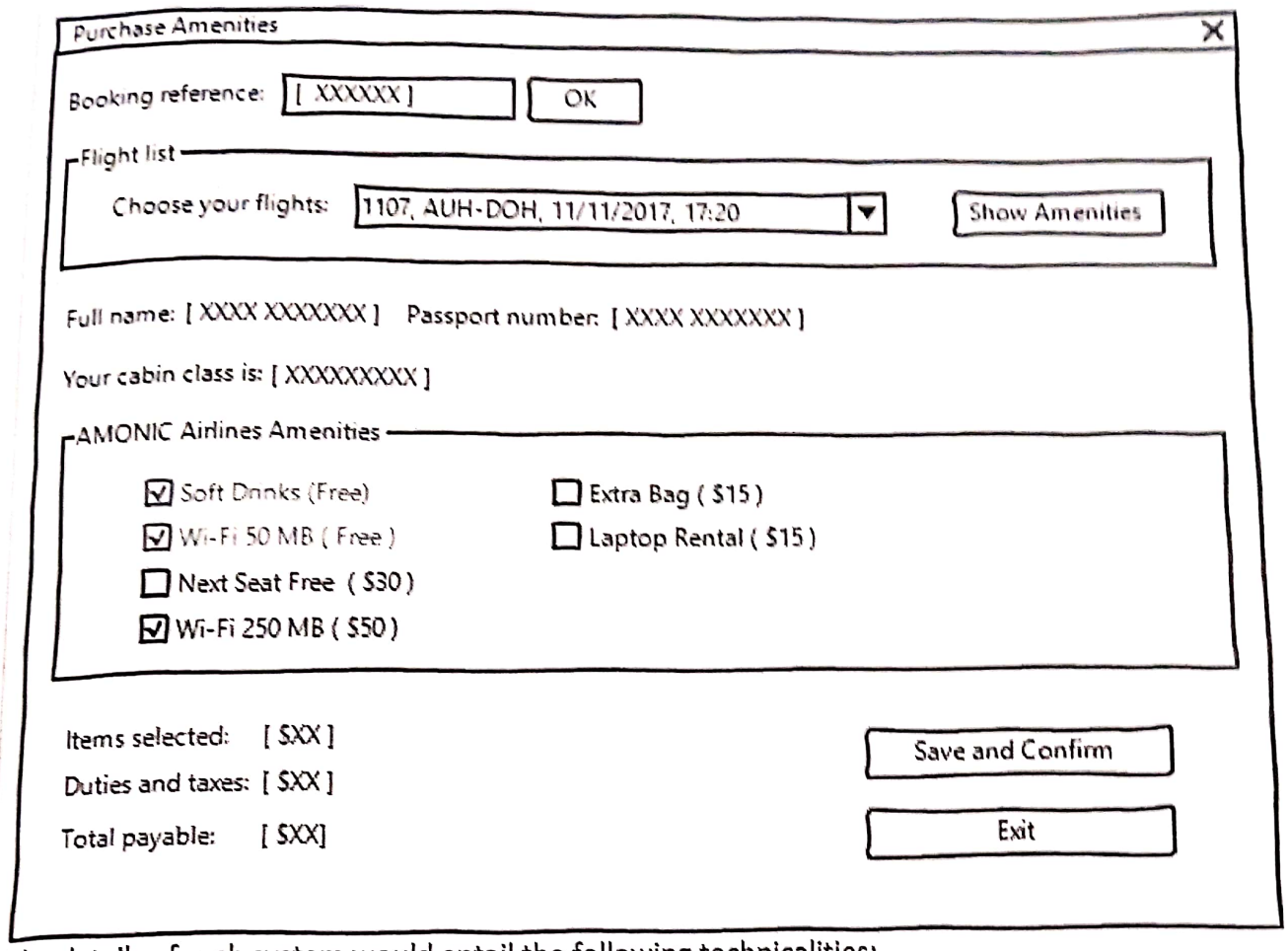
Depending on your preferred RDBMS platform, a SQL scripts is made available. The said scripts consists of the database structure and data required to complete the required tasks. The data needs to be imported to the database created for this session named "Session5".
As instructed by the designers, the database structure provided for the purpose of this section cannot be altered. This applies to removal of tables, adding or deleting any fields on the tables or of change in their data types.

To help further perceive the thinking behind the structure of the database, the database designers provide an Entity-Relationship Diagram (ERD). The aforementioned diagram explains the conceptual and representational model of data used in the database.



5.3 PURCHASING AMENITIES

The passengers flying AMONIC Airlines can walk into any of their offices or call them up and ask for extra amenities for their upcoming flights.

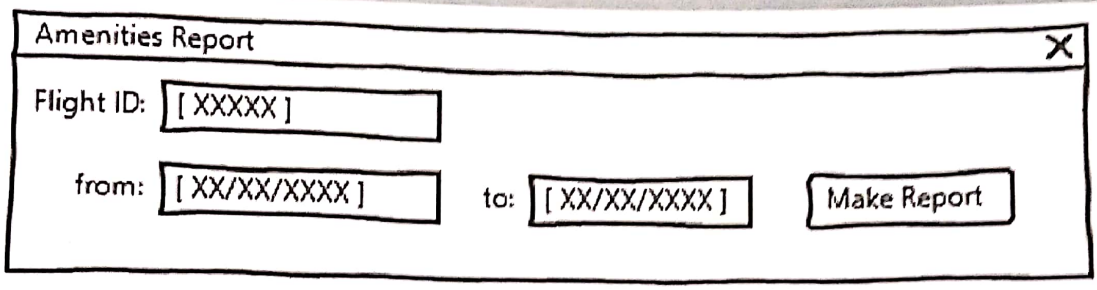


The details of such system would entail the following technicalities:

- To retrieve booking information, the first thing the user needs to enter into the system is their booking reference number.
- By searching the database for the booking reference number, they will be presented with a list of flights registered for that booking. Here are some things to consider:
  - This service is available up to 24 hours before each flight. It goes without saying that it should not work for the flights that have already flown out.
  - The list should contain the flight number, date of the flight, and the departure and arrival airports.
  - The user can choose the flight they need to purchase amenities for with a button.
  - The user must be able to change their flight at any time and it should not require them to close the form and come back.
- When the flight is confirmed, these items need to be made available to the user:
  - The cabin class, full name, and the passport number of the passenger needs to be shown for the representative to verify the correct booking.
  - List of the available amenities are retrieved from the database and shown to the user.
  - The items that are free (included as part of the cabin type) cannot be purchased.
- The form should also update the total payable amount in this way:
  - The total of all the items selected should be displayed as an item on the screen.
  - The duties and taxes will show how much the 5% value added tax will add to the amount.
  - Total payable is the sum of the extra charges for the selected amenities.

- If the flight chosen for the booking already has amenities purchased for on the database, the form should display those amenities (checkmark against them) and allow the user to make changes to it.
  - The total payable should subtract the amount paid for the last purchase from the current total and only ask for the difference. (negative values must be marked as refund)
- There should also be an exit button and a save button positioned at the bottom of the form.

5.4 REPORT OF AMENITIES NEEDED FOR FLIGHTS



Amenities	Wi-fi 50mb	Extra Blanket	Two Neighboring Seats Free	Laptop Rental	[.....]
Economy	68	40	0	2	[.....]
Business	0	8	1	0	[.....]
[....]					

The management needs a report of the amenities required for each flight 24 hours before flying time. This is so that the crew can prepare to offer the amenities as the passengers have requested them. This is a short description of what the report entails:

- The report displays the results either using a filter that searches for certain dates and the total amenities associated with them or by asking for a flight number and date of the flight. In the case of the latter it will show amenities required for a single flight and in the former it will be for all flights leaving on the dates specified.
- The list should include the total of the number of each amenities.
- You may arrange the report elements and layout in any way you wish.

5.5 TESTING SOFTWARE SOLUTION

The support desk at the airline has received complaints and bug reports for the reservation system from various offices. The list has now been compiled into a testing template.
By reading the varied scenarios as a software developer, you will need to run them on ReservationSystem.exe and record the rundown as requested.

5.6 DESIGNING AND ANALYSING DATABASE (OVERDRIVE)

One of the departments in AMONIC Airlines has prepared a case study and has described the way they work. They need technical documents in the form of two diagrams.
There is no need to develop the database but only to present our software developers the printable material (in pdf) for reference. The diagrams previously made available as part of this session can be used as reference.

PART 2

MODULE 6 MOBILE APPLICATION DEVELOPMENT

PART 6 of the Test Project consists of the following documentation/files:

1. WSC2017_TP09_S7_EN.pdf (Session 7 instructions)
2. API_Technical.pdf (Technical documentation for the airline's API)
3. BusinessClassSeats.png (Diagram of business class seats on an aircraft)
4. FirstClassSeats.png (Diagram of first class seats on an aircraft)
5. Amenities.xlsx (List of amenities for use in the application)

INTRODUCTION

For the last session, AMONIC Airlines is asking for a mobile application to both provide general information about the airline and provide limited services of convenience. The target platform chosen for this application is Android and an emulator is installed for you to test it.

The following sections are the main functionalities of the application:

- Provide public information about the airline and its flights.
- Process the API technical documentation and provide services provided.

DESCRIPTION OF PROJECT AND TASKS

In submitting your solution, please make sure the deliverables conform to the basic guidelines drawn out by different departments at AMONIC Airlines:

- There needs to be consistency in using the provided style guide throughout your work
- All software modules asked for, must have applicable and useful validation and error messages as is expected in the industry.
- There is an emphasis to make the mobile application appealing and usable.
- When using colours to differentiate between rows or records, there needs to be visible clarification on the screen as to what they stand for.
- The wireframe diagrams provided as part of this document are only suggestions and the solution produced should not in any way mirror what has been pictured.

- Time management is critical to the success of any project and so it is expected of all deliverables to be complete and operational upon delivery.

DURATION OF MODULE

3 hours only

DELIVERABLES

6.1 PREPARING THE API FOR USE

There's a pdf file provided by our backend technicians that helps you set up and use the Application Programming Interface (API) in the solution. When finished studying the documents please run the server and make sure that it works as expected.

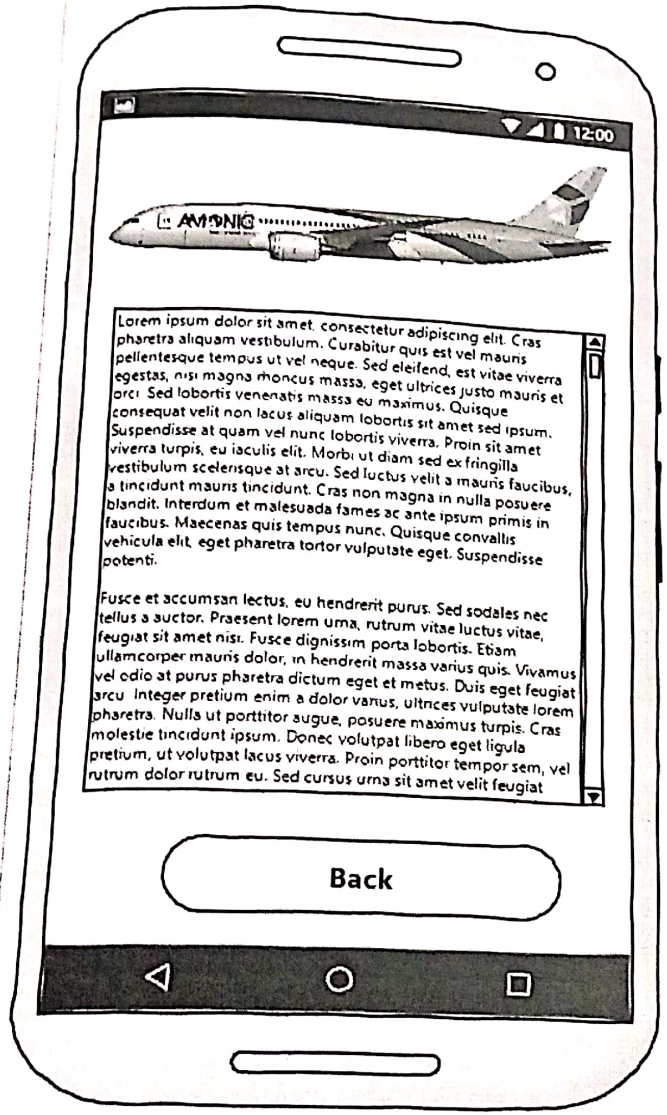
6.2 APPLICATION MAIN MENU

The first screen when the application starts is the main menu. The main menu should have buttons or links that direct the user to other parts of the application.
The menu items for the first menu are as follows:

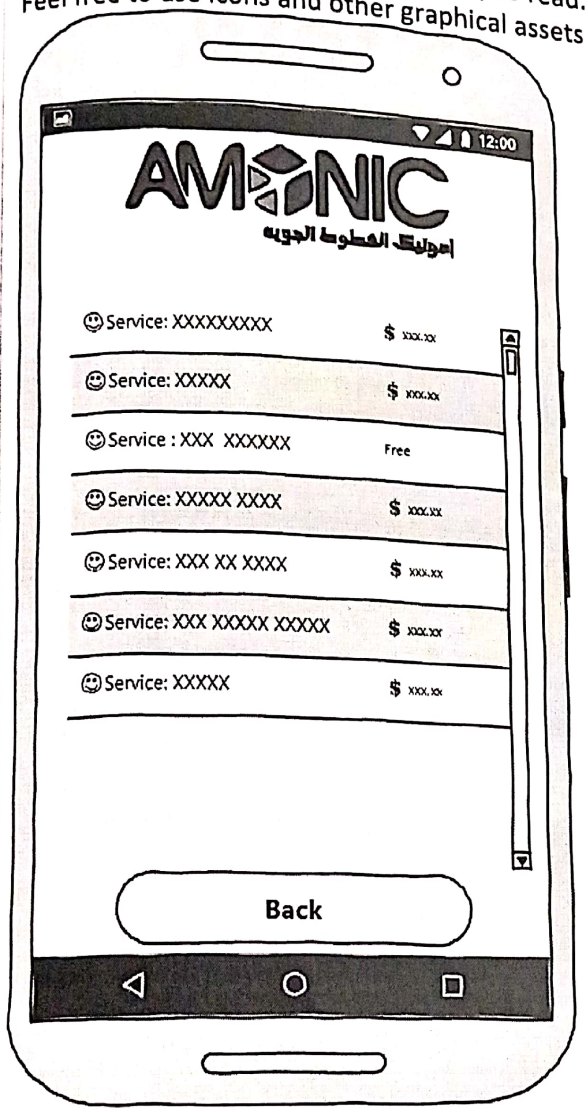
- Search Flights: helps the user find the correct flight and find information on them.
- Reserve Seat: allows business and first class passengers reserve their seat on their flight
- Amenities: gives the user a sense of what amenities are offered to improve their flight experience.
- About our Airline: will let the user find out more information about our airline and how we operate.

6.3 ABOUT AMONIC AIRLINES

As a new airline operating routes in the region, it is very important to provide information about the airline and how it operates.
One of the documents at your possession provides all the information the airline needs to your to present to the client.
Feel free to use other graphics and other visual elements to make this presentation of information more appealing.



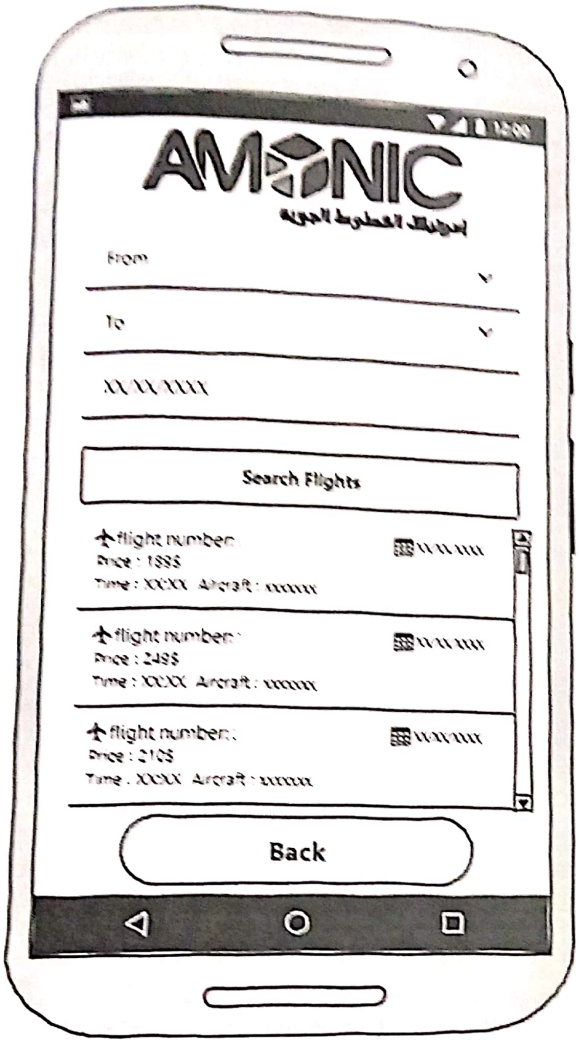
The file "Amenities.xlsx" has the list of all the amenities the airline provides. It is important to have it displayed in a way that is clear and easy to read.
Feel free to use icons and other graphical assets to improve the aesthetics.



6.5 SEARCHING FOR FLIGHTS

In this section of the application, the application will provide a way for the users to look to see if the airline has flights on specific dates.
The data for this section is extracted by using methods on the API described in the relevant technical documentation.
The search parameters are as follows:

- From is a combo list of the airports the airline uses as departure points.
- To is a combo list of the airports the airline has flights to from the source airport.
- The date also needs to be specified for the search functionality to work.



6.4 SEAT RESERVATION

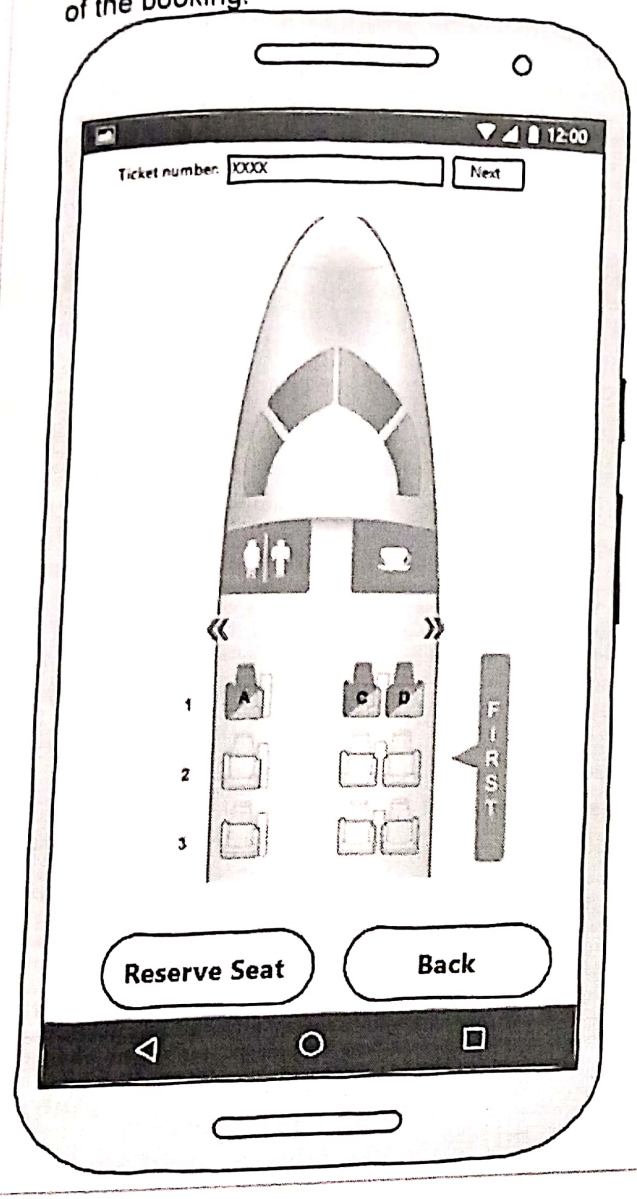
AMONIC Airlines is asking for an interface to enable their business and first class passengers to reserve their seats on the mobile application. Please refer to the technical documentation for the API to get more information on how to obtain backend information on the seating.

Here is what is envisioned to be included as part of this task:

- The ticket number is requested and once submitted, based on the cabin type, the application will do one these:
  - If the cabin type is business, an image of the aircraft with business class seats is displayed to the user. They can then choose one of the seats to reserve by touching them.
  - If the cabin type is first class, an image of the aircraft with first class seats is displayed. The user can then choose of the seats to reserve by touching them.

- If the cabin type is neither business nor first class, seat reservation will not be available to the user, an appropriate message will be displayed to inform them.
- If there has been a seat already retained for the ticket, the user may not reserve anymore. The application will need to show the user the current seat on record for the ticket.
- Each seat can only be reserved for one passenger. Passengers can't share seats.

- Once a seat is selected (touched) to be reserved, an appropriate message will tell the user the status of the booking.



Section B

Marking Scheme

The Assessment is done by awarding points by adopting two methods, Measurement and Judgments

- Measurement –One which is measurable
- Judgments-Based on Industry expectations
- Aspects are criteria's which are judged for assessment

Sub Criteria Name or Description	Aspect - Description	Max Mark
	MODULE - 1	
Correct delivery of all tasks		
	Proper time and work management that results in correct delivery of all assignments	0.50
Acceptable analysis and perception of the directives		
	There are clear signs that the solution conforms to what has been inteded	2.00
Valid analysis in importing user data		
	All the data need to be analyzed to represent the data transfer scheme	0.50
Coherent design to log activity as described		
	All the tables and fields are there and the relationships are set correctly	1.50
Adherence to style guide and standards		

	The submitted contents fully represent the identitty as described consistently	0.80
Importing external data		
	The user data is imported correctly and conforms to the conditions	0.20
Login form and operation of main forms		
	The login form is created and functions correctly to the description	0.30
	Identify correctly the system crashes as defined	0.60
	Creation of administration main form and its menus	0.20
	Implementation of the user list as instructed for the administration form	1.00
	Managing the user accounts (enabling/disabling and adding users)	1.50
	Creation of office user main form and its menus	0.20
	Correct display of the welcome message to the user	0.50
	Proper retrieval and display of user activity on system for the user form	1.00
Exception and Error handling		
	All errors are handled properly and system operates in unifed and complete manner	0.90
	Identify correctly the system crashes as defined	1.00

Validations and Comments	Ask the user to identify the problem and save it to the database	1.00
	Feedback messages are properly shown	0.70
	Comments in code are proper and valid	0.30
MODULE - 2		
Correct delivery of all tasks	Proper time and work management that results in correct delivery of all assignments	0.50
Acceptable analysis and perception of the directives	There are clear signs that the solution conforms to what has been inteded	2.00
	All the data need to be analyzed to conform with instructions in updating schedules	0.50
	Proper import of schedule data into the dastabase as described	2.00
Search and manage flight schedules	Flight schedule filter parameters are correctly implemented	0.50
	Correct display of list of flights based on search parameters	1.00
	Implementation search function on the flight schedules	1.50

	Cancellation and confirmation of button works as expected	0.60
	The ability to edit flight schedule is established as instructed	1.00
Validations and Comments		
	Feedback messages are properly shown	0.70
	Comments in code are proper and valid	0.30
MODULE - 3		
Correct delivery of all tasks		
	Proper time and work management that results in correct delivery of all assignments	1.00
Problem solving in searching for flights		
	Search in flights functions as instructed	1.00
Acceptable analysis and perception of the directives		
	There are clear signs that the solution conforms the database presented	1.50
	There are clear signs that the solution has the application standards described	1.50
	Lists direct, connecting and indirect flights appropriately	2.00

Search for flights		
	Flight schedule search parameters are correctly implemented	1.00
	List of outbound flights constructed correctly	2.00
	List of return flights constructed correctly	2.00
	Build the booking confirmation form form as described	0.50
	Submitting details of passengers on the booking confirmation form	2.00
	Issuing tickets and completeing reservation for passenger as intended	2.00
MODULE - 4		
Correct delivery of all tasks		
	Proper time and work management that results in correct delivery of all assignments	0.50
Problem solving in making the report and charts work		
	Understand the way data is layed out and create the correct data structure	1.00
	The appearance of the chart reflects the wireframe as described	1.00
Acceptable analysis and perception of the directives		

	There are clear signs that the solution conforms to what has been inteded	2.00
Correct analysis in creating the database		
	All the tables and fields are there and the relationships are set correctly	1.90
Developing reports for customer satisfaction survey		
	Complete the correct tables, fields and datatypes design	0.50
	Correct import of data files produced and provided	0.50
	Produce the summary form for the survey	1.50
	Produce the detailed report for the survey	1.50
	Correct calculation of total for each category	1.00
	Correct calculation of total for each rating in each query	0.50
	Fiiltering based on group of categories functions	1.00
	Filtering based on each category functions as expected	1.50
	Create the stacked bullet graph as instructed	2.00

Correct delivery of all tasks		
	Proper time and work management that results in correct delivery of all assignments	1.00
Acceptable analysis directives for amenities		
	There are clear signs that the solution conforms to what has been inteded	1.00
Database design is tailored to meet requirements		
	All the tables and fields included and created correctly show understanding of the case	2.00
	The relationships are correctly drawn to fulfill the needs	1.50
	Representative sequence diagram is set to represent the full case	2.00
Purchase amenities form		
	Show flights for the booking in the combo box correctly	0.50
	Show the list of amenities available as documented in the instructions	1.00
	Total payable is calculated and displayed correctly	0.30
	Correct retrieval and display of bought amenities based on records stored on database	0.50
	Update changes to an already made purchase	1.00
Testing software solution		

	Create the correct report to list amenities for each flight	1.50
	Testing the test case as described and coming up with correct results - Scenario #1	0.30
	Testing the test case as described and coming up with correct results - Scenario #2	0.30
	Testing the test case as described and coming up with correct results - Scenario #3	0.30
	Testing the test case as described and coming up with correct results - Scenario #4	0.30
	Testing the test case as described and coming up with correct results - Scenario #5	0.30
	Testing the test case as described and coming up with correct results - Scenario #6	0.30
	Testing the test case as described and coming up with correct results - Scenario #7	0.30
	Testing the test case as described and coming up with correct results - Scenario #8	0.30
	Testing the test case as described and coming up with correct results - Scenario #9	0.30

	Testing the test case as described and coming up with correct results - Scenario #10	0.30
MODULE - 6		
Correct delivery of all tasks	Proper time and work management that results in correct delivery of all assignments	0.50
Creativity in interface design and usability	The layout and overall look and feel are appropriate	0.50
	The mobile interface embodies the airline identity as intended in the style guide	0.50
	Usability and ease of navigation in the mobile application	1.00
Acceptable analysis and perception of the directives	There are clear signs that the solution conforms to what has been inteded	2.00
Mobile application	Main form of the application implemented as described	0.50

	The about us screen is displayed as intended	0.50
	Amenities services screen showing all the available amenities	0.50
	The search flight screen is displayed correctly	0.70
	The search flight screen functions as described	1.50
	The reserve seat screen is displayed correctly	1.00
	The reserve seat section fo the application works correctly	1.00
Validations and Comments		
	Feedback messages are properly shown	0.30
	Comments in code are proper and valid	0.20

Section C

Infrastructure list.

(Acceptable Pre-Installed software list)

1. Windows 10
2. Visual Studio 2015/ 2017
3. .NET Framework 4.6/4.7
4. Microsoft SQL Server Express 2014

5. SQL Server Management Studio
6. MySQL 5.7
7. .NET Connector
8. Workbench
9. Microsoft Visio Professional 2016
10. Xamarin (Cross platform development tool for mobile)
11. Android Studio 2.2.3
12. Adobe Reader DC
13. MS Office 2016 (WD,EXL, PPT)
14. Notepad++ 7.3.1

Section D

INSTRUCTIONS FOR COMPETITOR

General Rules

- Competitor should carry the id proof and birth date proof should reach venue 15 minute before the entry time.
- No Group work is permitted, it's individual competition.
- Module briefing will be for 15 minutes & will be done before the start of competition

- Open communication / Q&A will be conducted after module briefings.
- Module related queries will not be entertained after the start of competition.

Internet Access Rules

- You will have access to internet per module 10 minute except design Modules, 10 minutes to be utilise at stretch.
- Access will be subject to availability of Internet System
- You cannot copy, write from internet machines to your workstation.
- You are not permitted to use any communication application e.g. Chat, Facebook, WhatsApp etc.

Infrastructure Rules

- Any hardware failure during the completion may get extra time subject to approval of Jury/Experts.
- Candidates should not carry any devices, cell phones, material at competition desk.

Rules of competition

- Competitor will be disqualifying for any misbehaviour.
- All the rights of the competition are revered with State Skill Competition Committee.
- When you have finished the current module, you can proceed to the requirements for the next module.

Section E

Health, Safety and Environment

1. All accredited participants, and supporting volunteers will abide by rules and regulations with regards to Health, Safety, and Environment of the Competition venue.
2. All participants, technicians and supporting staff will wear the appropriate / required protective Personnel clothing.

3. All participants will assume liability for all risks of injury and damage to property, loss of property, which might be associated with or result from participation in the event. The organizers will not be liable for any damage, however in case of injury the competitor will immediately inform the immediate organizer for medical attention.

4. For any electrical or technical support contact the expert/supervision staff.

5. Do not plugin/plugin out any electric & electronics connections, seek for assistance.

6. Be careful while working on workstation so that feet should not strike to electric board or CPU system.