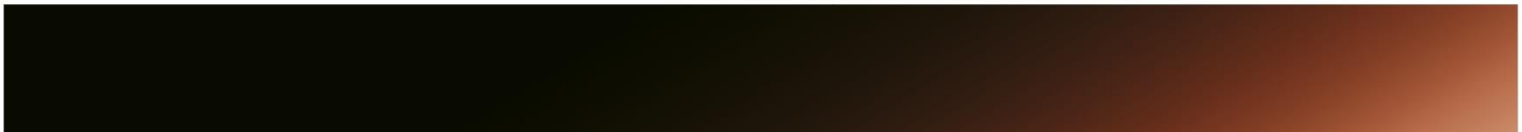
COMP.6212
Data Management

Assessment2: Semester 2, 2019
Assignment

Design and implement appropriate data access, management and storage technologies to match the application domain.

Due Date: 07 Nov 4.00 pm.
Weighting: 30%



Learning outcomes covered:

2. Design and implement appropriate data access, management and storage technologies to match the application domain.

Instructions:
All the parts of the assignment must be completed individually.

- In this assignment, you will use the logical design (ER Diagram) provided for the given case study, and modify it into a physical design and then implement the database using SQL Server.

Assignment Hand-in
Electronic submission of a copy of the report is required for the assignment. This copy will only be used as a backup for the paper version and must be uploaded to the Assignment Upload Link on MOODLE prior to 4:00 p.m. on the same due date as the paper version.

Special Assessment Circumstances
All assessments are to be completed by the due date specified in course outlines. Work not submitted by the due date will be given a fail grade unless an extension has been granted. Extensions will only be granted in exceptional circumstances.

Students who anticipate difficulty in submitting assessments by the due date may request an extension in accordance with the following conditions:

- Requests for individual student extensions must be made to their lecturer seven days prior to the due date;
- Students must provide acceptable documentary evidence to support their application for extension.

Assistance to other Students
Students themselves can be an excellent resource to assist the learning of fellow students, but there are issues that arise in assessments that relate to the type and amount of assistance given by students to other students. It is important to recognise what types of assistance are beneficial to another's learning and also what types of assistance are unacceptable in an assessment.

Beneficial Assistance

- Study Groups.
- Discussion.
- Sharing reading material.

Unacceptable Assistance

- Working together on one copy of the assessment and submitting it as own work.
- Giving another student your work.
- Copying someone else's work. This includes work done by someone not on the course.
- Changing or correcting another student's work.
- Copying from books, Internet etc. and submitting it as own work. Anything taken directly from another source must be acknowledged correctly: show the source alongside the quotation.

REPORT Guidelines

A HARDCOPY report must be submitted with the assignment cover sheet that is available next to the IT Assignment Box in the Library. An ELECTRONIC copy of your report must also be uploaded to the Assignment-2 Upload Link on MOODLE.

The Report must be set out in a professional manner, as if presenting to a client.

The report should contain the following:

1 A TITLE PAGE identifying the report title, the name and ID number of the student, date completed.

2 A TABLE OF CONTENTS identifying sections of the report as well as the corresponding page numbers.

3 An INTRODUCTION to the report.

4 A section on the PHYSICAL DESIGN that contains:

4.1 Use the current data volume details given below to modify the ER Diagram provided to create a data volume map.

a. The total number of employees is 10
b. The total number of clients in the database is 15000.
c. The total number of animals in the database is 12000.
d. The total number of vets is 8
e. The total number of rooms is 4
f. The total number of specialities of vets is 12.
g. 50% of the animals have been treated twice.
h. 20% of the animals have been treated thrice (3 times).
i. 30% of the animals have been treated once.
j. There are 8 time slots per day.
k. The schedule is prepared for 30 days period ahead.
l. There are 200 different sites records are available on the database.
m. On average each site has about 4 call schedules.
n. On average each vet has 3 specialities.

4.2 Create the following tables of the database (see the ER Diagram provided) using Transact- SQL commands in Microsoft SQL Server. Specify primary keys and referential integrity constraints in your commands. If a table has foreign key(s), state the appropriate on-delete action.

Table structures are:

EMPLOYEE(E#, E_Firstname, E_Surname, StreetNo, StreetName, Suburb)
PK- E#

ROOM(R#, RoomName)
PK- R#

TIMESLOT(Slot#, From, To)
PK- Slot#

VET (V#, V_Firstname, V_Surname, StreetNo, StreetName, Suburb, ContactNo)
PK- V#

SPECIALITY(SP#, Description)
PK- SP#

VS (V#, SP#)
PK – (V#, SP#) – composite key
FK – V#, and SP#

CLIENT(C#, C_Firstname, C_Surname, StreetNo, StreetName, Suburb, ContactNo)
PK- C#

ANIMAL(A#, AName, C#)
PK- A#
FK – C#

SCHEDULE(Sch#, V#, Slot#, R#,Oncall)
R#, V# and Slot# nulls should be allowed
PK - Sch#
FK – V#, Slot# and R#

CALL_SCHEDULE (V#, Site#, From, To)
PK – (V#, Site#) – composite key
FK – V#, and Site#

TREATMENT(T#, Date_of_Treatment, V#, A#, Site#, Treatment_Given)
Site# - nulls should be allowed
PK - T#
FK – V#, A# and Site#

SITE(Site#, SiteType, StreetNo, StreetName, Suburb)
PK- Site#

4.3 Populate tables with data (Enter at least five records to each table).
Include the INSERT SQL commands used to create tables in your report.

4.4 Create a Database Diagram with all the tables in it. Include a screen dump of the Database Diagram in your report. You must save the diagram of your database for the examiner to check.

4.5 Create index files to improve performance for appropriate tables. You may use the assumption that there should be at least 20000 records in a table to improve performance using an index file.
Include the CREATE INDEX SQL commands used to create index files in your report

4.6 A suggestion of one possible de-normalisation (merging tables) to improve performance of the database in the ER Diagram provided. You must describe both positive and negative consequences of the merge. Attributes of the merged tables must be shown using standard relational notations indicating primary keys and the foreign keys in your report.

4.7 Create the following reports using the reports using the SQL Server Report Builder.

- List of clients(First Name, Surname) and their animals
- List of scheduled vets (First Name, Surname) on a particular day (see the sample report on the case study).

You must state the name of your database for the examiner to check.

4.8 A Data Dictionary, containing details about each table for the case (e.g. field name, field description, data type, size, domain, range, example, required, indexed, primary key, foreign key, format and default value), organised for easy reference. The data dictionary must reflect the Final ERD.

Marking Schedule

	Expected Outcome	**Marks Allocated**
3	Introduction	6
4.1	Data volume Map	10
4.2	Create 12 tables of the database using Transact- SQL commands	
	a. Commands to create 12 tables	6
	b. Primary key CONSTRAINTS included for each table (12 required)	6
	c. Foreign key CONSTRAINTS included (11 required)	11
	d. On Delete clause included for each foreign key CONSTRAINT(11 required)	11
4.3	Populate 12 tables using INSERT commands	6
4.4	Create Database Diagram for the database (screen dumps).	5
4.5	Create Index files (4 x 3)	12
4.6	De-normalisation	
	a. Suggestion	3
	b. Table structure of the merged table with PK and FK indicated	4
	c. Positive impact of the change	2
	d. Negative impact of the change.	2
4.7	Screen dumps of two reports	
	a. List of clients , animals, and treatments given to each animal.	5
	b. List of scheduled vets on a particular day	5
4.8	Data Dictionary (12 tables)	6
Total		100

Assignment 2 - Report Checklist

(*Tick boxes of requirements met*)

- ❑ Cover Sheet
- ❑ Title page
- ❑ Table of contents
- ❑ Introduction
- ❑ Data volume Map
- ❑ Create Table commands for 12 tables
- ❑ Insert commands to populate data for 12 tables
- ❑ Database Diagram of the database
- ❑ Business rules by process
- ❑ Create index commands
- ❑ De-normalisation suggestion, structure of the merged table, positive and negative impact of the change.
- ❑ Screen dumps of the two reports
- ❑ Data dictionary for 12 tables.

Case Study – Wopwop Animal Care Service

You have been assigned to design and build a database for an animal clinic called Wopwop Animal Care Service (WACS*)*. Currently, WACS uses a paper based system to keep track of duty schedules of veterinarians (vets), allocations of animals to vets and the treatments given to animals. The current informal paper-based system that is being used often causes problems in keeping track of available vets, scheduling vets and the details of, and the treatments given to, animals.

WACS intends to be the leading animal care provider in the region. The main aim of the new database system is to provide a robust system so that the employees and clients are presented with accurate information of availability of vets , and the treatments given to, animals. It is hoped that the new database system will raise the efficiency of WACS services, and result in increasing client satisfaction. The Office Manager (Devon) hopes an increase of the annual profit by 15% after the implementation of this database system.

WACS employs a number of office staff in addition to a number of veterinarians (vets). Each vet has at least one (highly likely more) speciality. The specialities include: small animals, large animals, exotic, equine etc. The centre will be open Monday through to Saturday, with a vet on-call for Sunday. Devon schedules which vets are on duty, in order to ensure that there is at least two vets (maximum four vets as four is the maximum number of consulting rooms) available daily. Only one vet is required for Sunday on-call. The Clients can either book (by phone) a vet with the required speciality, or be allocated an available vet when they arrive at the clinic. The same applies when a vet is called out for an on-site (farm, zoo, house...) consultation. All vet clinic staff should be able to see which time slots are allocated and available for each vet.

The system will need to:

1. Register vets and office staff
2. Register clients and their animals.
3. Allow office manager to schedule vets availability
4. Ensure that there are vets available during the main hours of the day.
5. Help clients to select vets for particular appointments.
6. Allow vets to confirm that they saw an animal and record treatments given to animal.

Sample Reports Required

i List of clients and their animals.

ii List of scheduled vets on a daily basis.

iii List of clients and their animals which have been seen by which vet on a daily basis.

Sample reports

1. List of clients and their animals

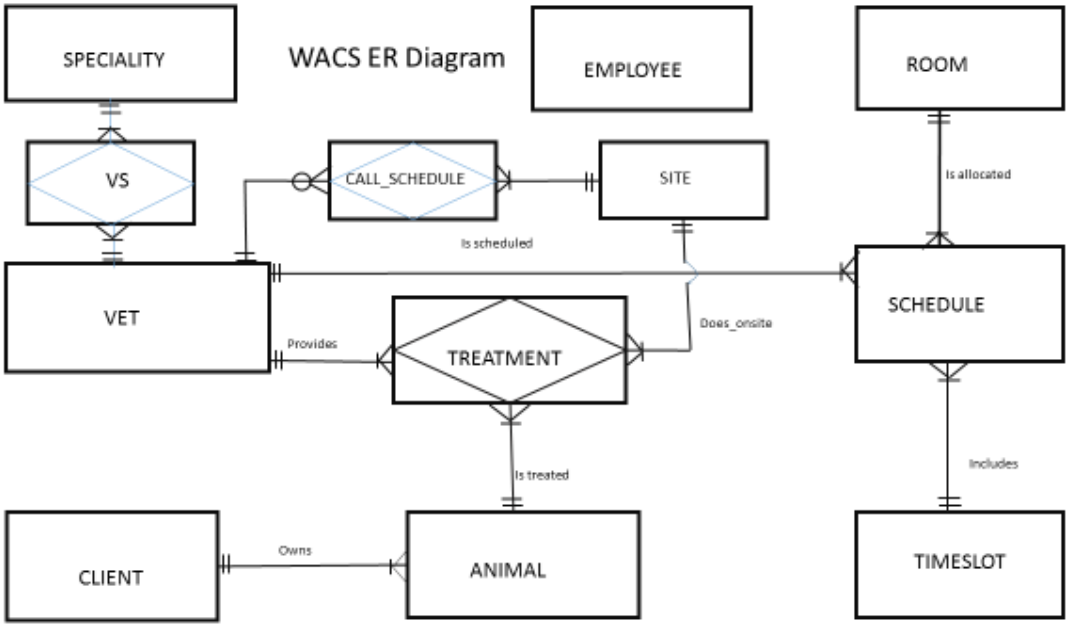
Client Name	Animal Name
Rose Brown	Rosy
Clair Singh	Showy
Natalia Brown	Sky Ray
Nancy Kaur	Mulley

2. List of scheduled vets on 14/03/2019.

Room No	From(time)	To(time)	Name of Vet
01	9.00	10.00	Marie Gunn
01	10.00	11.00	Mary Hutchison
01	11.00	12.00	Marie Gunn
01	15.00	16.00	Marie Gunn
02	9.00	10.00	John Martin
02	14.00	15.00	John Martin
04	9.00	10.00	Norman Bank

3. List of clients and their animals which have been seen by which vet on 14/03/2019.

Client Name	Vet Name	Animal Name	Treatment Given
Rose Brown	John Martin	Rosy	Pain killer/Antibiotic
Clair Singh	Norman Bank	Showy	Leg operation/Antibiotic
Natalia Brown	Mary Hutchison	Sky Ray	Fungal Infection/Antifungals



ROOM(R#, RoomName)
TIMESLOT(Slot#, From, To)
VET (V#, V_Firstname, V_Surname, StreetNo, StreetName, Suburb, ContactNo)
SPECIALITY(SP#, Description)
VS (V#, SP#)
EMPLOYEE(E#, E_Firstname, E_Surname, StreetNo, StreetName, Suburb)
CLIENT(C#, C_Firstname, C_Surname, StreetNo, StreetName, Suburb, ContactNo)
ANIMAL(A#, AName, C#)
SCHEDULE(Sch#, V#, Slot#, R#,Oncall) – R# and Slot# nulls should be allowed
CALL_SCHEDULE (V#, Site#, From, To)
TREATMENT(T#, Date_of_Treatment, V#, A#, Site#, Treamement_Given)
SITE(Site#, SiteType, StreetNo, StreetName, Suburb)