Final Client-Consultant Database Project

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MIS 370: Database Design & Development

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June 2023

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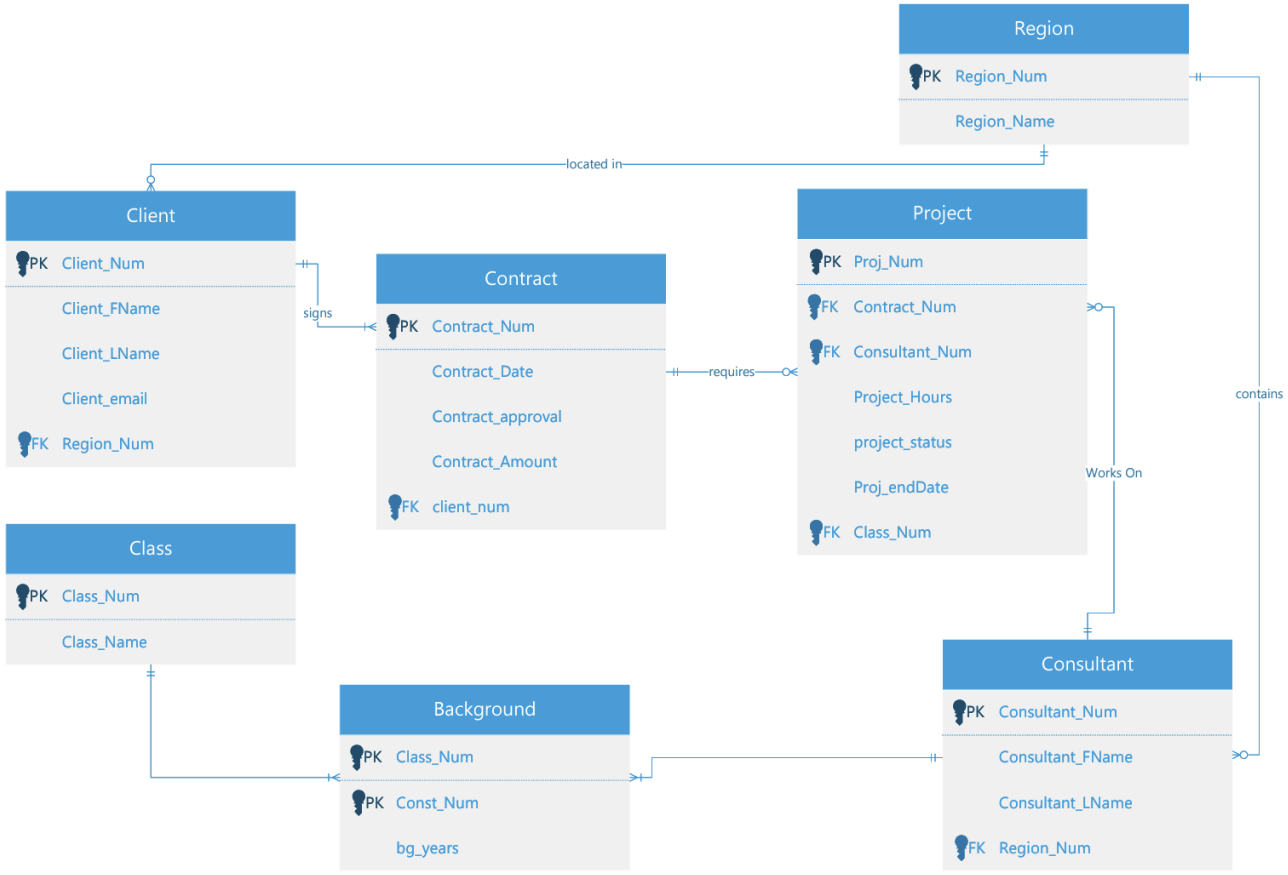
Assumptions

1. Every Project can be in either of these three statuses: canceled, active or complete.
2. Contracts not yet signed will not yet have projects assigned to them. Once they've been signed by the client, consultants would then be able to work on projects that meet the respective contract.

ERD



Legend

Consultant # is designated as cons_num and consultant_num.

3NF Relational Schema

Project(Proj_Num, Contract_#, Consultant_#, Project_hrs, project_status, project_endDate, Class_#)
Client(Client_#, Client_FName, Client_LName, Client_email, Region_Num)
Class(Class_#, Class_Name)
Region(Region_#, Region_Name)
Contract(Contract_#, Contract_Date, Contract_approval, Contract_Amount, Client_#)
Background(Class_#, Consultant_#, bg_years)
Consultant(Consultant_#, Consultant_FName, Consultant_LName, Region_Num)

REPORTS

1 - Client Region Distribution:

Number of Clients from each Region

```
SELECT client_fname, client_lname, client_email, region_name
FROM Client, Region
WHERE client.region_num=region.region_num;
```

By reflecting to the company the distribution & background of their client populations, the company is able to better gauge how they can alter their services in order to meet the demands of clients who might originate from certain regions. An example of this could be to relocate or hire more consultants who might be able to serve areas with higher client populations and relocate those who have less densely populated client regions.

```
sqlite> select client_fname,client_lname, client_email,region_name
   ...> from Client,Region
   ...> where client.region_num=region.region_num;
Client_FName  Client_LName  Client_Email           Region_Name
------------  ------------  ---------------------  -----------
Marriane      Brown         m.brown@gmail.com      MIDWEST
James         Smith         j.smith@gmail.com      SOUTHEAST
John          McCollough    j.mccollough@gmail.com NORTHWEST
Douglass      Boyde         d.boyde@gmail.com      SOUTHEAST
Mary          Patel         m.patel@cea.com        SOUTHEAST
Jennifer      Lightfoot     lightfoot@gmail.com    NORTHEAST
Sue           West          S.west@gmail.com       NORTHWEST
Vin           Davidson      vdavidson@gmail.com    MIDWEST
Luis          Cliff         lcliff@gmail.com       SOUTHEAST
Percy         Rosenburg     prosenburg@gmail.com   WEST
Stanley       Einstein      stanleye@gmail.com     SOUTHEAST
sqlite>
```

2 - Background Distribution:

Highlights Consultants with the most Experience

SELECT consultant_fname, consultant_lname, class_name, bg_years as 'Experience yrs'
FROM Consultant, Background, Class
WHERE consultant.consultant_num=background.cons_num and
class.class_num=background.class_num;

By calculating the number of years each consultant has in a specific area. The company is able to have data over the consultant 's background and how well-versed they might be with meeting client demand. This ultimately can help with areas such as advertisement to external companies and clients as well as consultant development in relation to analyzing which consultants might benefit from additional training to continue developing in the business.

```
sqlite> select consultant_fname,consultant_lname,class_name,bg_years as 'Experience yrs'
   ...> from consultant,background,class
   ...> where consultant.consultant_num=background.cons_num and class.class_num=background.class_num;
Consultant_FName  Consultant_LName  Class_Name         Experience yrs
----------------  ----------------  -----------------  --------------
Rachel            Carson            Database Admin     2
Gerard            Ricardo           Mobile App         4
Angela            Jamison           Internet Services  5
Karl              Spenser           Internet Dev       6
Anne              Dimarco           Internet Services  7
Andres            Martinez          Network install    2
Julian            Donatello         Database Admin     1
Geraldo           Rivera            Web application    4
Donald            Chen              Database desing    6
Stephanie         Rosen             Network install    3
sqlite>
```

3 - Project Statuses:

Snapshot of Consultant Progress with their Projects from signed Contracts

SELECT proj_num, consultant_fname, consultant_lname, project_status
FROM Consultant, Contract, Project
WHERE project.consultant_num=consultant.consultant_num
GROUP BY: proj_num;

From all contracts that have been signed and approved, this report would reflect to a manager how each consultant is progressing based on the projects that they've been assigned. This also ensures that consultants are staying on track and are doing what is expected of them to ensure that they are doing their jobs & are meeting the goals of solving the problems of clients in a timely manner. Additionally, this report might also give companies a sense of pacing; if consultants are finishing projects earlier than the set end date for instance, they might reflect high efficiency levels and can be assigned more clients / projects.

```
sqlite> select proj_num, consultant_fname, consultant_lname,project_status
   ...> from Consultant, Contract, Project
   ...> where project.consultant_num=consultant.consultant_num
   ...> group by proj_num;
Proj_num  Consultant_FName  Consultant_LName  Project_status
--------  ----------------  ----------------  --------------
100       Rachel            Carson            Complete
101       Angela            Jamison           Active
102       Angela            Jamison           Active
103       Geraldo           Rivera            Complete
105       Gerard            Ricardo           Complete
106       Julian            Donatello         Active
107       Geraldo           Rivera            Active
109       Stephanie         Rosen             Canceled
110       Andres            Martinez          Active
111       Gerard            Ricardo           Active
112       Donald            Chen              Canceled
sqlite>
```

4 - Consultant Region Distribution:

Number of Consultants from each Region

```
SELECT consultant_num, consultant_fname, consultant_lname, class_name,
region_name
FROM Class, Consultant, Region, Background
WHERE consultant.region_num=region.region_num and
background.class_num=class.class_num and
background.cons_num=consultant.consultant_num
GROUP BY consultant_fname, consultant_lname;
```

By having an overview of where their consultants are from, the company is able to showcase to their clients how many regions they're able to accommodate and serve, the diversity in areas that they cover. This tells the organization what regions they might have the least consultants - and thus impact - in, helpful for when there might be future consultant hiring processes in which more consultants are needed in specific areas over others. This report can additionally be compared to the report made on the client region distribution to see if there are trends between the two, and if the organization is accurately accommodating for/meeting their consumer demand.

```
sqlite> select consultant_num, consultant_fname, consultant_lname, class_name, region_name
   ...> from class, consultant, region, background
   ...> where consultant.region_num=region.region_num and background.class_num=class.class_num and background.cons_num=consultant.consultant_num
   ...> Group by consultant_fname,consultant_lname;
Consultant_num  Consultant_FName  Consultant_LName  Class_Name         Region_Name
--------------  ----------------  ----------------  -----------------  -----------
37              Andres            Martinez          Network install    SOUTHEAST
25              Angela            Jamison           Internet Services  SOUTHEAST
38              Anne              Dimarco           Internet Services  SOUTHEAST
18              Donald            Chen              Database desing    WEST
45              Geraldo           Rivera            Web application    SOUTHEAST
34              Gerard            Ricardo           Mobile App         SOUTHEAST
22              Julian            Donatello         Database Admin     MIDWEST
56              Karl              Spenser           Internet Dev       MIDWEST
29              Rachel            Carson            Database Admin     MIDWEST
20              Stephanie         Rosen             Network install    NORTHEAST
sqlite>
```

5 - Available Consultants:

Consultants not in any projects

SELECT consultant_fname, consultant_lname, class_name
FROM Consultant, Class
WHERE consultant.consultant_num not in (select consultant_num from project) and class.class_num=consultant.class_num;

Identifying the consultants who have no current projects allows for managers the ability to delegate necessary tasks to those who don't have as much on their plate. The class data alongside each consultant identifier allows for managers to also be reminded of their specialities in the instance there's an additional project that they need to delegate which calls for specific classifications. While consultants are waiting for contracts to be signed in order to begin projects, they'd be available for additional assignments that could be internal in helping further develop the company.

```
sqlite> select consultant_fname, consultant_lname, class_name
   ...> from consultant,class
   ...> where consultant.consultant_num not in (select consultant_num from project)
   ...> and class.class_num=consultant.class_num;
Consultant_FName  Consultant_LName  Class_Name
----------------  ----------------  ----------------
Karl              Spenser           Internet Dev
Anne              Dimarco           Internet Services
```

6 - Projects per Consultant:

Number of Projects and Project Hours each Consultant has worked

```
SELECT consultant_fname, consultant_lname, sum(project_hours) as 'Total HRS Worked',
count(project.consultant_num) as 'Num of Projects'
FROM Consultant, Project
WHERE consultant.consultant_num=project.consultant_num
GROUP BY consultant_fname, consultant_lname;
```

By assessing the consultants that have signed contracts the manager is able to see how much of a workload is on each of their workers' plates at one time, and which consultants are putting in more time into their work in comparison to those who've been putting in the least amount of time. This might help in allowing for certain consultants to stand out based on the number of projects and time they're able to put in which reflects to managers who might stand out from the rest and who might need additional training. Simultaneously using this report helps with preventing consultants from having to take on too much at one time if others are able to afford putting more time into meeting the demands of clients with less active projects. This report can also be used to ensure that consultants have an evenly distributed project load, preventing employee burnout and ensuring that the organization can run efficiently with meeting project deadlines & customer demand.

```
sqlite> select consultant_fname,consultant_lname,sum(project_hours) as 'Total HRS Worked', count(project.consultant_num) as 'Num of Projects'
   ...> from consultant,project
   ...> where consultant.consultant_num=project.consultant_num
   ...> group by consultant_fname,consultant_lname;
Consultant_FName  Consultant_LName  Total HRS Worked  Num of Projects
----------------  ----------------  ----------------  ---------------
Andres            Martinez          8                 1
Angela            Jamison           34                2
Donald            Chen              9                 1
Geraldo           Rivera            25                2
Gerard            Ricardo           13                2
Julian            Donatello         11                1
Rachel            Carson            22                1
Stephanie         Rosen             6                 1
sqlite>
```

7 - Current Contract Amount being Handled:

Total of all contracts both signed / unsigned

```
SELECT sum(contract_amount) as 'Total Contract Amount'
FROM Contract;
```

This allows for the company a chance to get a bigger picture compiled into one value over how much they are handling at one time. This data allows for the ability to track performance from one period of time to the next, and also allows for the company to see the potential in their earnings (with inclusion of both contracts that have been signed and not yet signed by the client). Perhaps this report can also be compared to the amount that the company is ultimately able to successfully gain from signed contracts.

```
sqlite> select SUM(contract_amount) as 'Total Contract Amount' from Contract;
Total Contract Amount
---------------------
14306175
sqlite>
```

8 - Contract Overview per Client:

Contract Number and Dollar Amount per Client

```
SELECT client_fname, client_lname, sum(contract_amount) as 'Total Contract Amount',
count(contract.client_num) as 'Total Contracts'
FROM Client, Contract
WHERE contract.client_name=client.client_num
GROUP BY client_fname, client_lname;
```

Assessing how involved clients are with the company allows for the identification of which customers are investing the most into consulting services. With clients who have the contracts worth the highest amounts, and who have a greater number of these contracts, the company is able to better assess the relationship that should be established with those individuals. This also might aid in allowing for consultants to prioritize when it comes to managing several projects by several clients with different contract values.

```
sqlite> select client_fname, client_lname, sum(contract_amount) as 'Total Contract Amount', count(contract.client_num) as 'Total contracts'
   ...> from client,contract
   ...> where contract.client_num=client.client_num
   ...> group by client_fname, client_lname;
Client_FName  Client_LName  Total Contract Amount  Total contracts
------------  ------------  ---------------------  ---------------
Douglass      Boyde         2120000                1
James         Smith         1920300                2
John          McCollough    3249000                1
Luis          Cliff         1234567                1
Marriane      Brown         2985000                1
Mary          Patel         128000                 1
Percy         Rosenburg     543210                 1
Stanley       Einstein      1223999                2
Vin           Davidson      902099                 1
sqlite>
```

9 - Contract Status & Client Contacts:

Inclusive of all current contracts by client and how to reach clients

SELECT contract_num, client_fname, client_lname, client_email, contract_approval
FROM Contract, Client
WHERE contract.client_num=client.client_num;

By giving an overview of what contracts have been signed and which haven't, a rough overview of the contract signing rate could be seen. With this report consultants are able to contact clients if a contract remains unsigned for a longer than usual period of time. If there are quite a few unsigned contracts at one time, the company is able to notice this and immediately make evaluations based on the reasoning behind this possible trend.

```
sqlite> select contract_num, client_fname, client_lname, client_email, contract_approval
   ...> from contract,client
   ...> where contract.client_num=client.client_num;
Contract_num  Client_FName  Client_LName  Client_Email           Contract_approval
------------  ------------  ------------  ---------------------  -----------------
5841          Marriane      Brown         m.brown@gmail.com      Signed
5842          James         Smith         j.smith@gmail.com      Signed
5843          James         Smith         j.smith@gmail.com      Signed
5844          John          McCollough    j.mccollough@gmail.com Unsigned
5845          Douglass      Boyde         d.boyde@gmail.com      Unsigned
5846          Mary          Patel         m.patel@cea.com        Signed
5849          Vin           Davidson      vdavidson@gmail.com    Unsigned
5850          Luis          Cliff         lcliff@gmail.com       Signed
5851          Percy         Rosenburg     prosenburg@gmail.com   Signed
5852          Stanley       Einstein      stanleye@gmail.com     Signed
5853          Stanley       Einstein      stanleye@gmail.com     Signed
sqlite>
```

10 - Contract-Project Timeline:

Signing Dates of Contracts alongside Project End Dates

```
SELECT proj_num, contract.contract_num, contract_date, project_enddate
FROM Contract, Project
WHERE contract.contract_num=project.contract_num and contract_approval='Signed'
and project_enddate is NOT NULL;
```

By showcasing all of the dates that projects are due by, managers and consultants are able to plan ahead. With this report they can gauge busier weeks throughout the month or months throughout the year, and might find trends when it comes to when clients tend to sign contracts or if there's a time range in which client demand is typically the highest.

```
sqlite> select proj_num, contract.contract_num,contract_date, project_endDate
   ...> from contract, project
   ...> where contract.contract_num=project.contract_num and contract_approval='Signed' and project_endDate is NOT NULL;
Proj_num  Contract_num  Contract_date  Project_endDate
--------  ------------  -------------  ---------------
100       5841          02-10-18       07-10-18
101       5842          02-15-18       03-01-18
103       5841          02-10-18       06-10-18
105       5846          03-01-18       03-29-18
110       5851          03-10-18       05-12-18
111       5852          02-20-18       04-02-18
sqlite>
```

APPENDIX

SQL CODE USED TO CREATE TABLES:

```
 CREATE TABLE BACKGROUND
   (Class_num INT NOT NULL,
   Cons_num INT NOT NULL,
   bg_years INT,
   PRIMARY KEY(Class_num, Cons_num));

CREATE TABLE REGION
   (Region_num INT PRIMARY KEY NOT NULL,
   Region_Name VARCHAR(10) NOT NULL);

CREATE TABLE PAYMENT
   (Payment_ID INT PRIMARY KEY NOT NULL,
   Contract_num INT NOT NULL,
   Payment_Status VARCHAR(10),
   Payment_date datetime);
CREATE TABLE CLASS
   (Class_num INT PRIMARY KEY NOT NULL,
   Class_Name VARCHAR(25) NOT NULL);

CREATE TABLE CONTRACT
   (Contract_num INT PRIMARY KEY NOT NULL,
   Contract_date datetime,
   Contract_approval VARCHAR(10),
   Contract_amount MONEY,
   Client_num INT NOT NULL);

 CREATE TABLE CONSULTANT
   (Consultant_num INT NOT NULL,
   Consultant_FName VARCHAR(10),
   Consultant_LName VARHCAR(10),
   Class_Num INT,
   Region_num INT,
   PRIMARY KEY(Consultant_num));
CREATE TABLE CLIENT
   (Client_num INT PRIMARY KEY NOT NULL,
   Client_FName VARCHAR(10),
   Client_LName VARCHAR(10),
   Client_Email VARCHAR(25),
   Region_num INT);
CREATE TABLE PROJECT
   (Proj_num INT PRIMARY KEY NOT NULL,
   Consultant_num INT NOT NULL,
   Contract_num INT NOT NULL,
   Project_hours INT,
   Project_status VARCHAR(10),
   Project_endDate datetime,
   class_num INT NOT NULL);
```

```
Insert into background values
(9003,29,2);
Insert into background values
(9005,34,4);
Insert into background values
(9002,25,5);
Insert into background values
(9007,56,6);
Insert into background values
(9002,38,7);
Insert into background values
(9004,37,2);
Insert into background values
(9003,22,1);
Insert into background values
(9001,45,4);
Insert into background values
(9006,18,6);
Insert into background values
(9004,20,3);
```

```
insert into project values
(100,29,5841,22,'Complete','07-10-18',9003);
insert into project values
(101,25,5842,10,'Active','03-01-18',9002);
insert into project values
(102,25,5843,24,'Active',NULL,9002);
insert into project values
(103,45,5841,7,'Complete','06-10-18',9001);
insert into project values
(105,34,5846,12,'Complete','03-29-18',9005);
insert into project values
(106,22,5847,11,'Active','04-05-18',9003);
insert into project values
(107,45,5848,18,'Active','05-03-18',9001);
insert into project values
(109,20,5850,6,'Canceled',NULL,9004);
insert into project values
(110,37,5851,8,'Active','05-12-18',9004);
insert into project values
(111,34,5852,1,'Active','04-02-18',9005);
insert into project values
(112,18,5853,9,'Canceled',NULL,9006);
```

```
Insert into region values
(7001,'MIDWEST');
Insert into region values
(7002,'SOUTHEAST');
insert into region values
(7003,'NORTHEAST');
insert into region values
(7004,'NORTHWEST');
insert into region values
(7005,'WEST');

Insert into CLASS values
(9001, 'Web application');
insert into class values
(9002,'Internet Services);
insert into class values
(9003,'Database Admin');
insert into class values
(9004,'Network install');
insert into class values
(9005,'Mobile App');
insert into class values
(9006,'Database desing');
insert into class values
(9007,'Internet Dev');


insert into consultant values
(29,'Rachel','Carson',9003,7001);
insert into consultant values
(25,'Angela','Jamison',9002,7002);
Insert into consultant values
(34,'Gerard','Ricardo',9005,7002);
insert into consultant values
(56,'Karl','Spenser',9007,7001);
insert into consultant values
(38,'Anne','Dimarco',9002,7002);
insert into consultant values
(37,'Andres','Martinez',9004,7002);
insert into consultant values
(22,'Julian','Donatello',9003,7001);
insert into consultant values
(45,'Geraldo','Rivera',9001,7002);
insert into consultant values
(18,'Donald','Chen',9006,7005);
insert into consultant values
(20,'Stephanie','Rosen',9004,7003);
```

```
insert into client values
(298, 'Marriane', 'Brown', 'm.brown@gmail.com', 7001);
insert into client values
(289,'James','Smith','j.smith@gmail.com',7002);
insert into client values
(285,'John','McCollough','j.mccollough@gmail.com',7004);
insert into client values
(280,'Douglass','Boyde','d.boyde@gmail.com',7002);
insert into client values
(275,'Mary','Patel','m.patel@cea.com',7002);
insert into client values
(270,'Jennifer','Lightfoot','lightfoot@gmail.com',7003);
insert into client values
(265,'Sue','West','S.west@gmail.com',7004);
insert into client values
(260,'Vin','Davidson','vdavidson@gmail.com',7001);
insert into client values
(255, 'Luis','Cliff','lcliff@gmail.com',7002);
insert into client values
(250,'Percy','Rosenburg','prosenburg@gmail.com',7005);
insert into client values
(245,'Stanley','Einstein','stanleye@gmail.com',7002);

insert into contract values
(5841,'02-10-18','Signed',2985000.00,298);
insert into contract values
(5842,'02-15-18','Signed',670300.00,289);
insert into contract values
(5843,'03-12-18','Signed',1250000.00,289);
insert into contract values
(5844,'04-12-18','Unsigned',3249000.00,285);
insert into contract values
(5845,'02-13-18','Unsigned',2120000.00,280);
insert into contract values
(5846,'03-01-18','Signed',128000.00,275);
insert into contract values
(5847,'03-15-18’,'Signed',323000.00,270);
insert into contract values
(5848,'02-17-18','Signed','1092000.00,265);
insert into contract values
(5849,'02-28-18','Unsigned',902099.00,260);
insert into contract values
(5850,'04-01-18','Signed','1234567.00',255);
insert into contract values
(5851,'03-10-18','Signed',543210.00,250);
insert into contract values
(5852,'02-20-18','Signed',99999.00,245);
insert into contract values
(5853,'02-18-18','Signed',1124000.00,245);
```