CSC423 Project Case Study: SuperMaids Cleaning Company

Team 9:
Zubaer Chowdhury
Oscar Arana
Justin Prince

Part 1:

The SuperMaids Cleaning Company specializes in providing cleaning services for clients. Each type of client has a set of requirements. For example, The Cardboard Box Company requires cleaning services from Monday to Friday 7am until 9am and 5pm until 7pm each day, but P. Nuttall only requires cleaning services on a Wednesday from 10am until 1pm. Each requirement will have a unique identifier and the following information will be stored: start date, start time, duration and comments. Whenever a new client is taken on, it is determined whether any special equipment is required and when. For example, three industrial floor cleaners may be needed on two out of five occasions for one client. Therefore, the following information will be stored for each equipment, in addition to the equipment identifier: description, usage and cost. For each employee, the following data will be stored: staff number (uniquely identifies an employee), first and last name, address, salary and telephone number. For each client, the following data will be stored: client number (uniquely identifies a client), first and last name, address and telephone number.

A relational database should be developed following the subsequent steps for the case study described in this PDF. All steps must be included in the corresponding report.

Reports: A report will be created for each deadline including detailed documentation of each of the steps addressing all the required items. ER diagrams for the conceptual and logical models must be included in the corresponding reports. All assumptions made in the design must be clearly stated. Screenshots of the contents of the database created for each part of step 3 must be included in the report.

Part 1: Develop a conceptual data model reflecting the following requirements:

a. Identify the main entity types
Ans a:

The following have been chosen to be the main entity types as each have their own unique attributes:

i. Employee
ii. Client
iii. Request
iv. Equipment

b. Identify the main relationship types between the entity types identified in "a".
Ans b:

i. A Client may have many Request
A Request is made by at least one Client
Client to Request: One-to-Many

ii. A Request may need many Equipments
A Equipment may be used for many Requests
Request to Equipment: Many-to-Many

iii. An Employee may be assigned to fulfill many Requests
A Request may be fulfilled by many Employees
Employee to Request: Many-to-Many

c. Determine the multiplicity constraints for each relationship identified in "b".
Ans c:

i. One Client must have one to many Requests
One Request is made by a Client
Assumptions: A Client must have at least one Request
Client to Request: 1 … *
Request to Client: 1 … 1

ii. One Request may need zero to many Equipments
One Equipment may serve zero to many Requests
Assumption: An equipment can stay in storage unassigned
Request to Equipment: 0 … *
Equipment to Request: 0 … *

iii. One Employee may serve zero to many Requests
One Request may be fulfilled by one to many Employees
Assumption: An Employee might not be available to be assigned to a Request
Employee to Request: 0 … *
Request to Employee: 1… *

d. Identify attributes and associate them with entity or relationship types.
Ans d:

i. **Employee**
   1. staffNo (unique)
   2. staffLName
   3. staffFName
   4. staffAddress
   5. staffSalary
   6. staffTelNo

ii. **Client**
   1. clientNo (unique)
   2. clientFName
   3. clientLName
   4. clientAddress
   5. clientTelNo

iii. **Request**
   1. requestID (unique)
   2. startDate
   3. startTime
   4. duration
   5. comments

iv. **Equipment**
    1. equipmentID (unique)
    2. description
    3. usage
    4. cost

e. Determine candidate and primary key attributes for each (strong) entity type.
Ans e:

{PK} = Primary Key
(CK) = Candidate Key

i. **Employee**
    1. staffNo {PK}
    2. telephoneNo (CK)
       Assumption: Each Employee has a unique telephone number.

ii. **Client**
    1. clientNo {PK}
    2. telephoneNo (CK)
       Assumption: Each Employee has a unique telephone number.

iii. **Request**
    1. requestID {PK}

iv. **Equipment**
    1. equipment ID {PK}

f. Generate the E-R diagram for the conceptual level (no FKs as attributes).

Ans f:

E-R Diagram for the Conceptual Level for SuperMaids Cleaning Service