Project Information

Submission Deadline: 14 May 2023

This project is an individual effort!

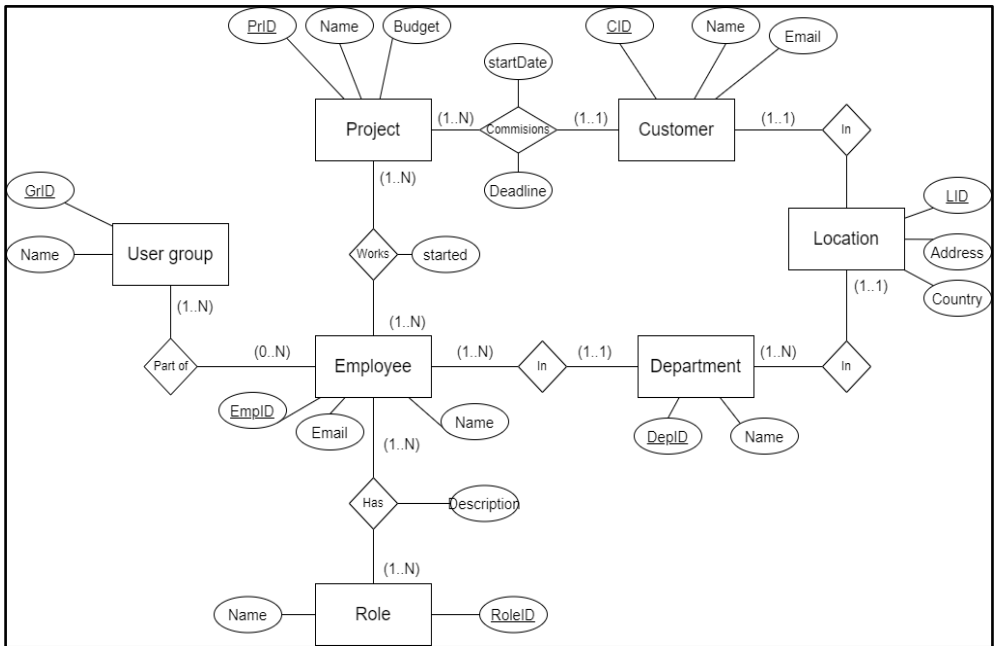
Scenario

You are tasked to design a database system that manages customers, projects, employees, user groups and roles for an IT company. Given the ER model, you must create a relational model and make various plans and decisions regarding the database system. These plans need to be documented and presented to the company owners, who have to approve them before your team can start implementing the database system.

The company **BiDi** has the following particulars, which should be considered for making decisions as a DBA:

The initial budget for the database administration and implementation: €100000 (exclusive of salaries)

- BiDi has 1000 employees.
- BiDi is a project-based IT company that deals in implementing medical support systems/applications for its customers.
- There are roughly 50 concurrent users at a single time instance.
    - 80% are internal users, i.e., employees of BiDi.
    - 20% are external users, i.e., customers.
- BiDi has dozens of projects.
- BiDi has the following departments: HR, Software, Data, ICT, and Customer support.
- BiDi has offices at three different locations in Finland.



DBA Tasks:

Note: When you are not sure of a particular piece of information that you need to know for defining the following, state your assumptions to reason your decision.

Produce a document that details the following:

1. Design a Relational Model or database schema based on the ER model. (3p)
   Please, use a proper tool for this – No pen-and-paper drawing.
2. Decide on the DBMS application for BiDi. (3p)
3. Define the availability window by assuming the cost for downtime. (3p)
   a. Only define the window/percentage with assumed downtime costs.
   b. *Hint*: you can refer to the SLM slide in Lecture 3 to help define availability.
4. Partitioning (4p)
   a. Define at least two different ways to partition the data. Justify your decisions.
5. Integrity Rules (2p)
   a. Define ON UPDATE and ON DELETE rules for Project, Customer, User group, and Employee tables.
6. Management of Values (3p)
   a. Define default values.
   b. Define check constraints.
   c. Define how to manage NULL values.
7. Triggers and a Trigger Graph (4p)
   a. Create at least three different (and useful) triggers using PostgreSQL syntax.
   b. Draw a trigger graph.
8. Access Rights for Users (2p)
   a. Define access rights using PostgreSQL syntax based on the following:
      I. Each employee has access to the project they work on.
9. Security Issues and Measures (3p)
   a. Come up with at least three different security issues and have a countermeasure for each.
   b. Is there a need to comply with some regulatory standard(s)?
10. Design a checklist for managing changes. (3p)
    a. It must include 5 to 7 concrete checkpoints/steps related to change management.
11. Backup and Recovery, Disaster Plan (3p)
    a. Define the backup method and schedule. Justify your decisions.
    b. Come up with at least three realistic disasters and one extremely unlikely disaster.
    c. Define the recovery method from disasters.

The report has quality content, i.e., a logical flow, a good level of English and writing skills. (3p)

The use of images and graphs is recommended; use proper tools.
The recommended length of the report is 5 to 8 pages. It doesn't include the title page.

Deliverable:

1. Submission is on Moodle by 14.05.2023 23:59
2. A single .pdf file
    a. Write your name and student number in the report.
    b. Naming: *YourName*_ preport
    Example: “IflaahSalman_preport”