University of Colombo School of Computing

SCS 1203 – Database I

1st year, 1st semester

Take Home Assignment – Scenario 1

Group 37

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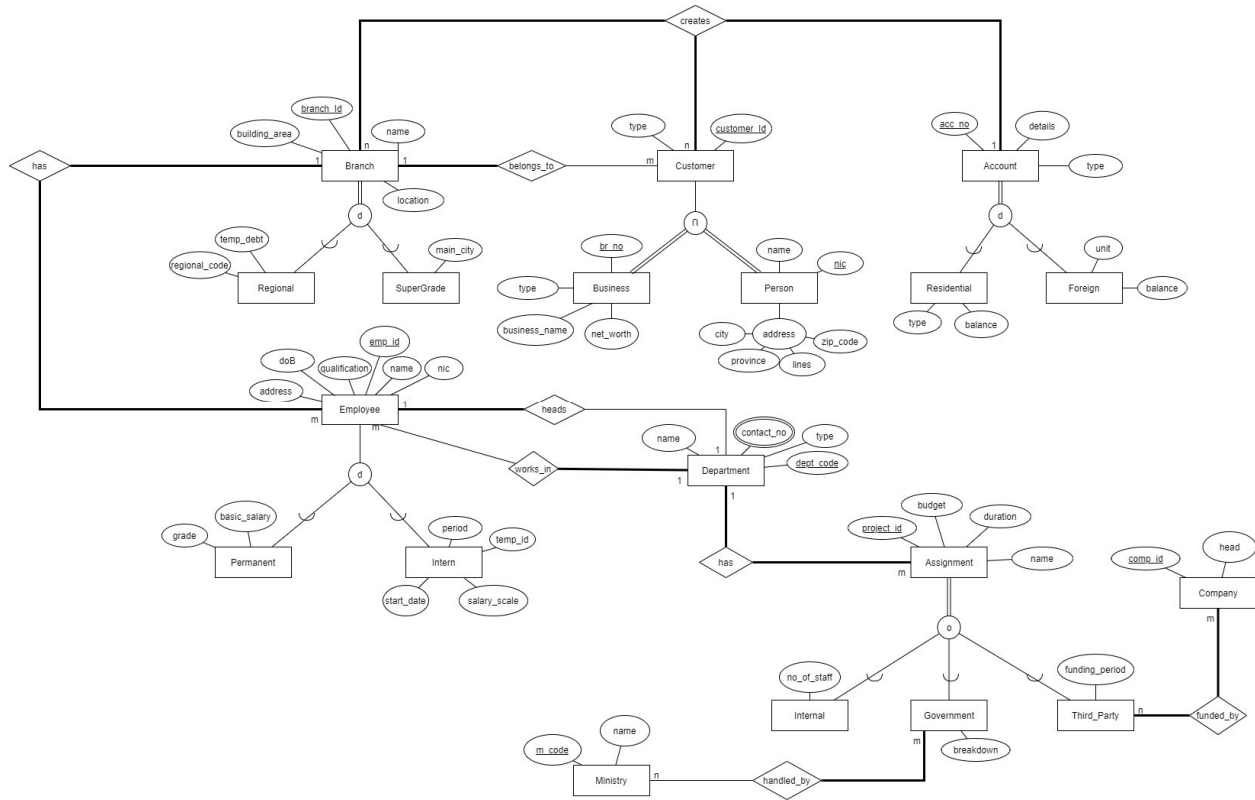# Table of Contents

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Figure 1 - ER/EER diagram

Bolded lines represent total participation in relationships

Assumptions

1. A ministry can handle many government assignments
2. A company cannot exist in the database if it does not fund a third party assignment.
3. The business name of a business is saved in the database
4. The department head can be any type of an employee
5. An assignment can be handled by one department only
6. A ministry cannot exist unless it handles a government assignment
7. A company cannot exist unless it funds at least one assignment

2. ER/EER mapping

Assignment (<u>project_id</u>, budget, duration, name, no_of_staff, task_breakdown, funding_period, internal_flag, government_flag, thirdparty_flag, *dept_code*)

Business (<u>br_no</u>, business_name, type, net_worth, *customer_id*)

Company (<u>company_id</u>, head)

Company_assignment (*<u>company_id</u>, <u>project_id</u>*)

Customer (<u>customer_id</u>, type, branch_type, *regional_branch_id*, *supergrade_branch_id*)

Department (<u>dept_code</u>, type, dept_name, *head*)

Department_contact (*<u>dept_code</u>*, <u>contact_no</u>)

Employee (<u>emp_id</u>, dob, qualification, emp_name, nic, emp_address, type, branch_type, *dept_code*, *regional_id*, *supergrade_id*)

Foreign_account (<u>acc_no</u>, details, unit, balance, branch_ type, *customer_id*, *regional_id*, *supergrade_id*)

Intern (*<u>emp_id</u>*, temp_id, period, start_date, salary_scale)

Ministry (<u>ministry_code</u>, name)

Ministry_assignment (*<u>ministry_code</u>, <u>project_id</u>*)

Permanent_employee (*<u>emp_id</u>*, basic_salary, grade)

Person (<u>nic</u>, person_name, address_lines, city, province, zip_code, *customer_id*)

Regional_branch (<u>branch_id</u>, building_area, branch_name, location, temp_debt, regional_code)

Residential_account (<u>acc_no</u>, details, residential_type, balance, branch_type, *regional_id*, *supergrade_id*, *customer_id*)

Supergrade_branch (<u>branch_id</u>, building_area, branch_name, location, main_city)

3. **Problems encountered during implementation of ER/EER mapping**

Since branch had disjoint classes of total participation, only the relations for the sub classes were made. This brought up difficulties when trying to enforce referential integrity constraints in employee, customer, and account relations. Therefore, an "enum" type attribute "branch_type" was made in all three afore mentioned relations. In addition to that, two more attributes named "regional_id" and "supergrade_id" were made. Upon insertion of data, a check is done on the branch type. If the branch type is "regional", "regional_id" must not be null and "supergrade_id" must be null, and vice versa if the "branch_type" is of type "supergrade".
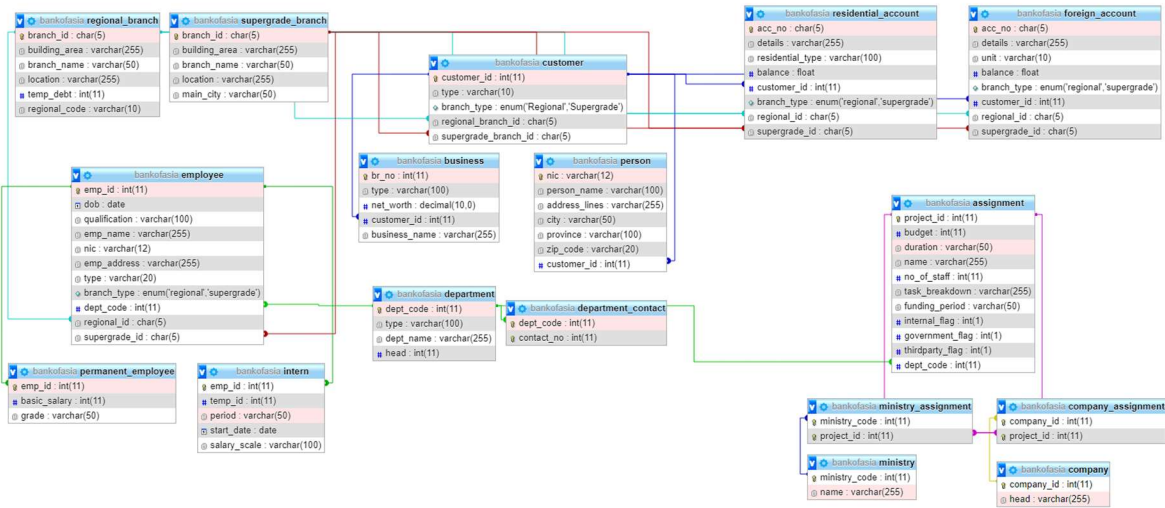
Figure 2 – Mapping

4. <u>User roles</u>

1. Manager
   Username: manager
   Password: password
2. HR
   Username: hr
   Password: password
3. Admin
   Username: admin
   Password: password
4. Employee
   Username: employee
   Password: password

The user roles have different levels of access to different relations.

- Manager
    - Select, update, and delete on "branch"
    - Delete on "customer", "person" and "business"
    - Select, insert, update, and delete on "assignment", "ministry_assignment" and "company_assignment"
- Employee
    - Select, insert, update, and delete on "foreign_account" and "residential_account"
    - Select, insert, and update on "customer", "person" and "business"
- HR
    - Select, insert, update, and delete on "employee", "permanent_employee" and "intern"
- Admin
    - Select, insert, update, and delete on "regional_branch" and "supergrade_branch"
    - Select, insert, update, and delete on "department" and "department_contact"

5. **PHP web interface**

1. Login Page
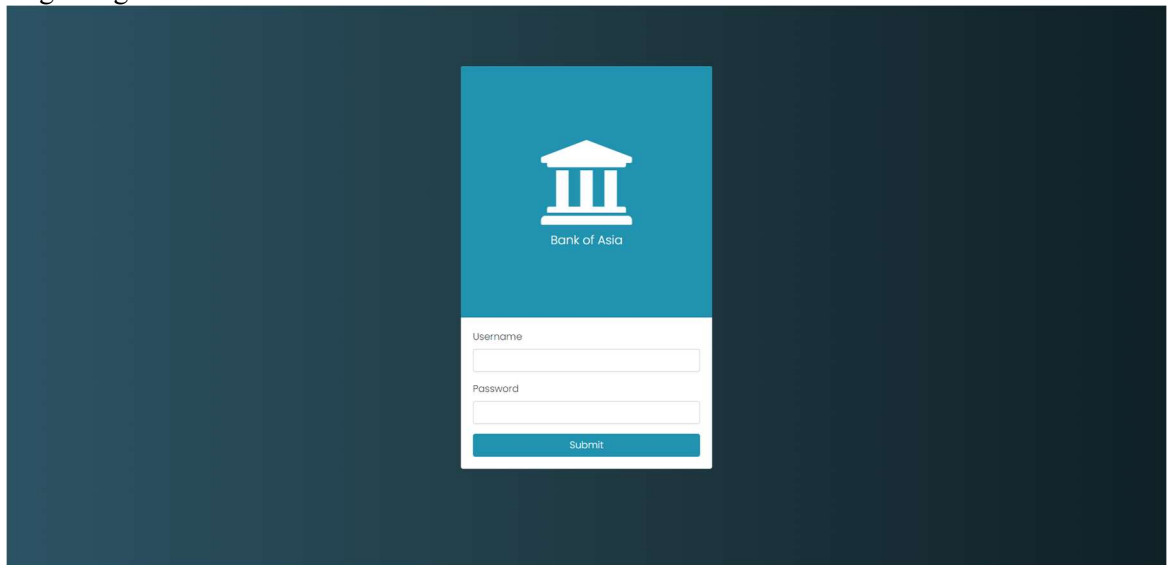
Figure 3 - Login Page

2. Home Page
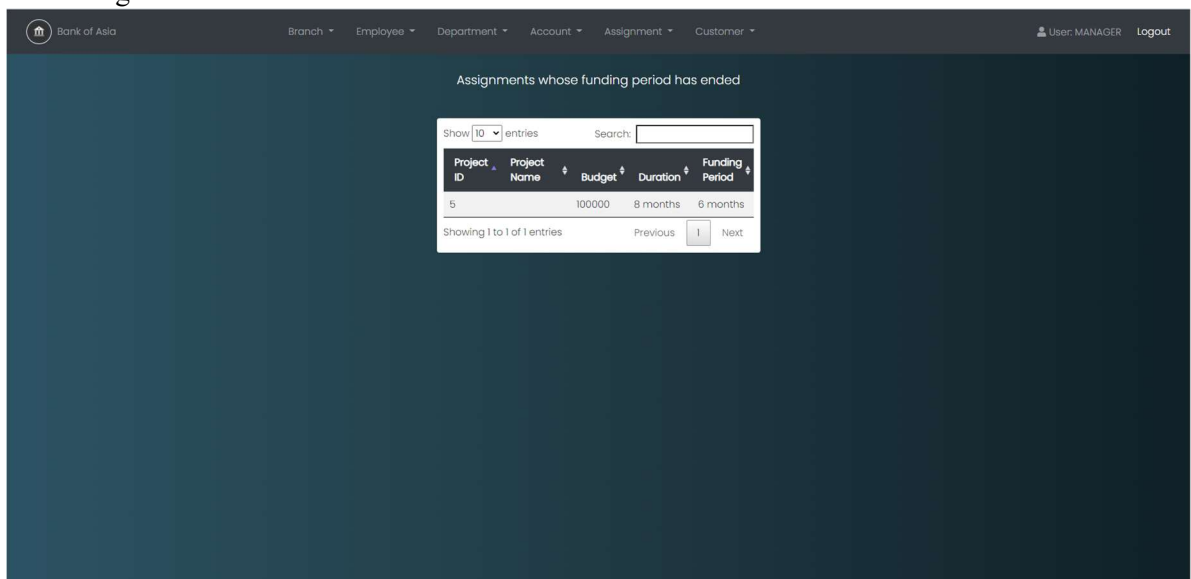
Figure 4 - Home Page

3. Insertion of data

Figure 5 - Form to insert data

4. Deletion of data

Figure 6 - Form for deletion of data

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5. Updating of data

Figure 7 - Form to update data

It is to be noted that although all forms are accessible by all user groups, only the users who have been granted the privilege to perform the corresponding SQL operation will be permitted to do the task. If not, an error message will be displayed.

For example, admin cannot add a customer.
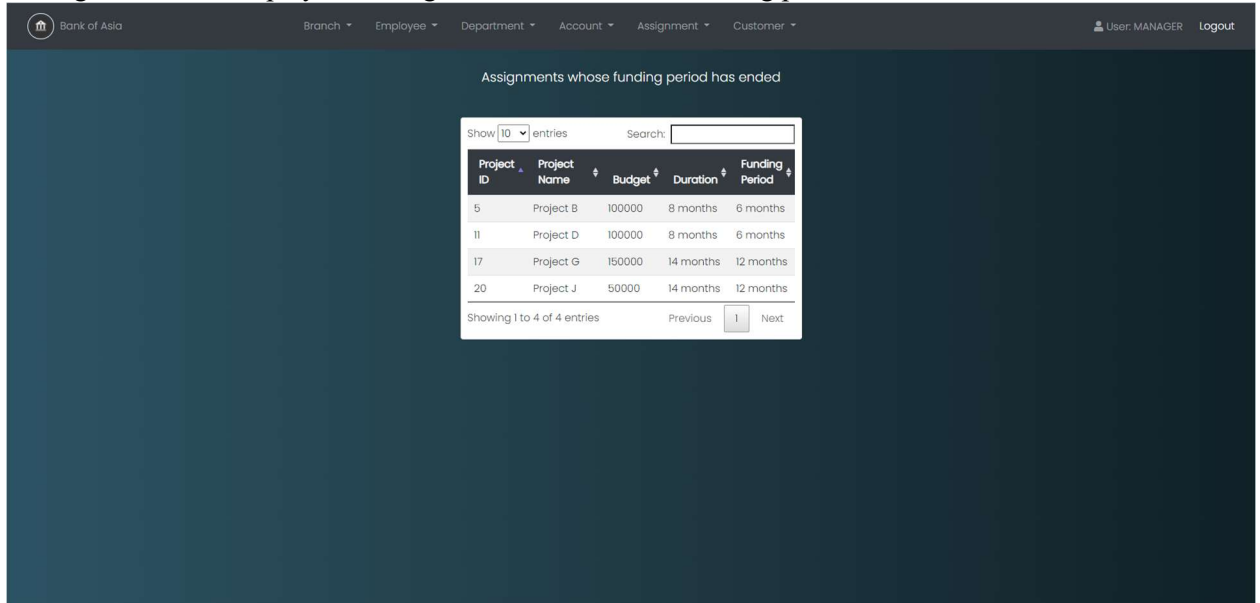
Figure 8 – Example of an error

6. **Implementation of user views**

The views are only accessible by their respective roles mentioned

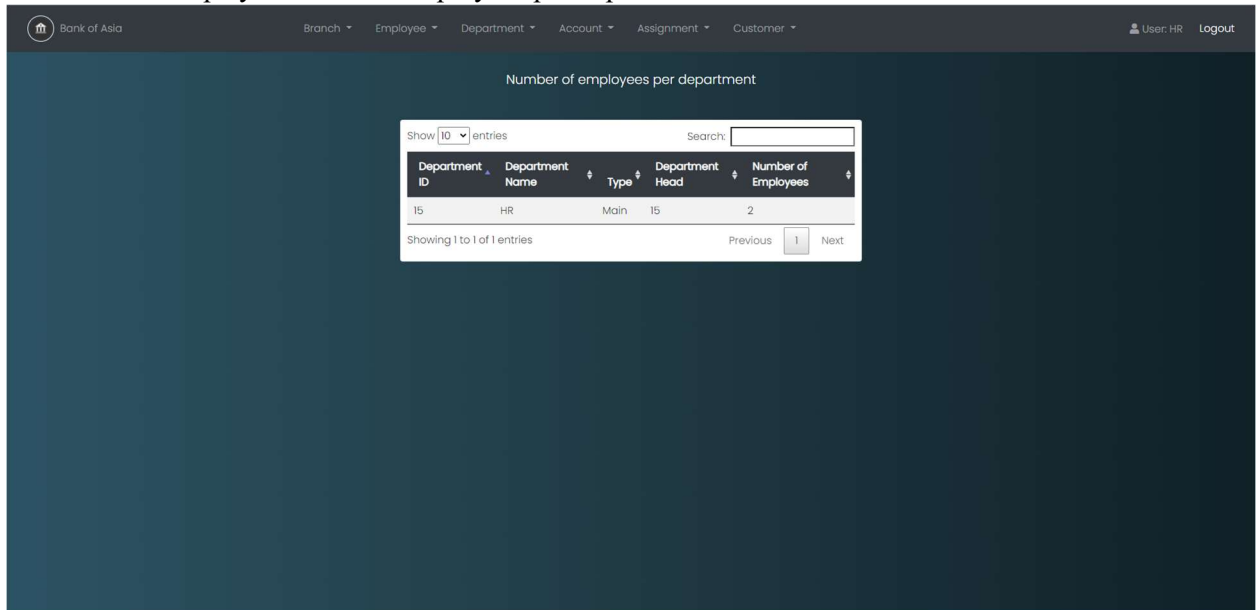1. Manager's view – Displays the assignments of which the funding period has ended

Figure 9 - Manager's view

2. HR's view – Displays number of employees per department

Figure 10 - HR's view

3. Employee's view – Displays the number of foreign accounts per customer

Figure 11 - Employee's View

4. Admin's view – Displays the number of assignments and total budget per department

Figure 12 - Admin's View

7. Individual contribution

Nethmi Rodrigo [19001462]

- Designing of ER/EER diagram
- Design and implementation of the basic structure of the PHP system
- Mapping of the ER/EER diagram
- Implementation of login, home, add branch, update branch, delete branch, add assignment, and delete assignment pages and the functionality of adding multiple contact numbers to a department.
- Creation of user roles and assigning access levels
- Creation and implementation of views for admin

Shawn Rodrigo [19001452]

- Mapping the ER/EER diagram
- Implementation of add employee, delete employee, update employee and update assignment pages.
- Creation and implementation of employee's view

Gimhani Rubasinghe [19001487]

- Designing and mapping of the ER/EER diagram
- Implementation of add customer, delete customer, update customer, add account, delete account, update account pages.
- Creation and implementation of view for manager role.

Chethiya Rodrigo [19001479]

- Mapping the ER/EER diagram.
- Implementation of add department, delete department, update department, update account and a part of update assignment pages.
- Creation and implementation of HR's view.