



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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1. ER/EER diagram

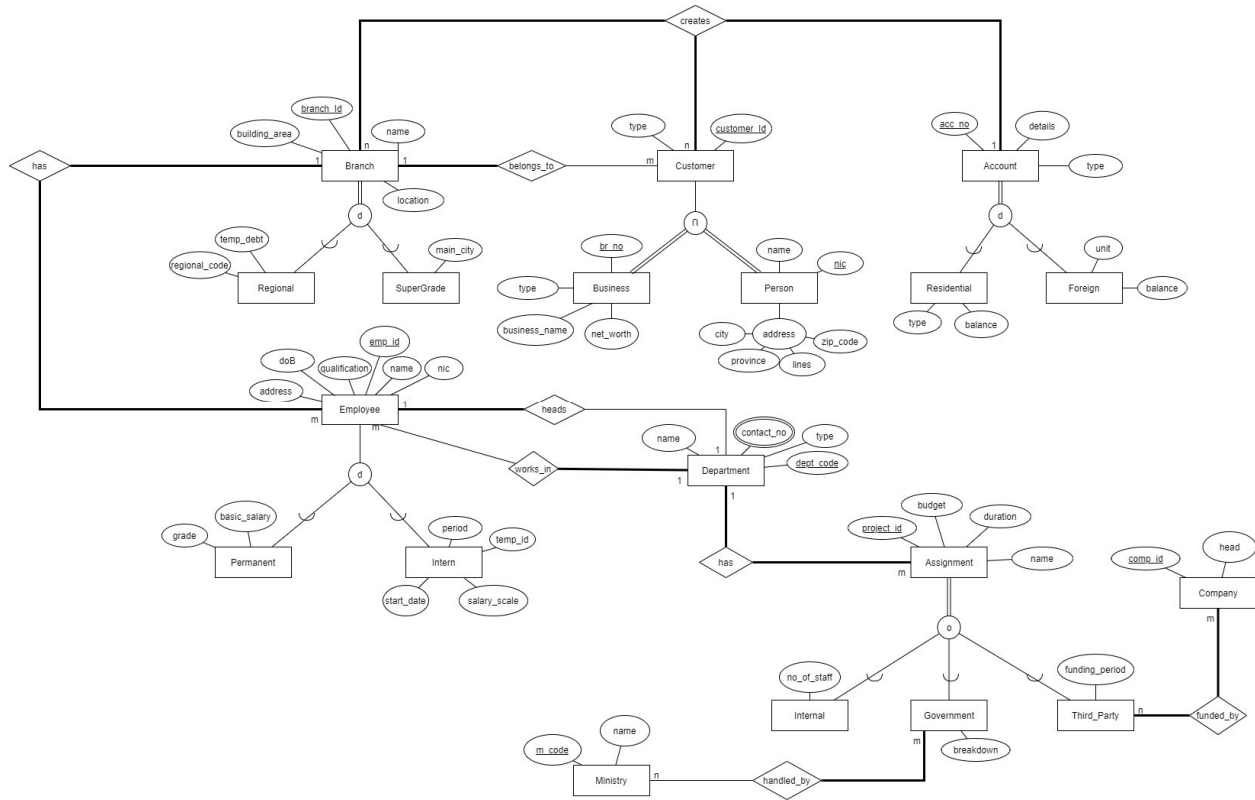


Figure 1 - ER/EER diagram

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 (project_id, budget, duration, name, no_of_staff, task_breakdown,
funding_period, internal_flag, government_flag, thirdparty_flag, dept_code)

Business (br_no, business_name, type, net_worth, customer_id)

Company (company_id, head)

Company_assignment (company_id, project_id)

Customer (customer_id, type, branch_type, regional_branch_id,
supergrade_branch_id)

Department (dept_code, type, dept_name, head)

Department_contact (dept_code, contact_no)

Employee (emp_id, dob, qualification, emp_name, nic, emp_address, type,
branch_type, dept_code, regional_id, supergrade_id)

Foreign_account (acc_no, details, unit, balance, branch_type, customer_id,
regional_id, supergrade_id)

Intern (emp_id, temp_id, period, start_date, salary_scale)

Ministry (ministry_code, name)

Ministry_assignment (ministry_code, project_id)

Permanent_employee (emp_id, basic_salary, grade)

Person (nic, person_name, address_lines, city, province, zip_code, customer_id)

Regional_branch (branch_id, building_area, branch_name, location, temp_debt,
regional_code)

Residential_account (acc_no, details, residential_type, balance, branch_type,
regional_id, supergrade_id, customer_id)

Supergrade_branch (branch_id, 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”.

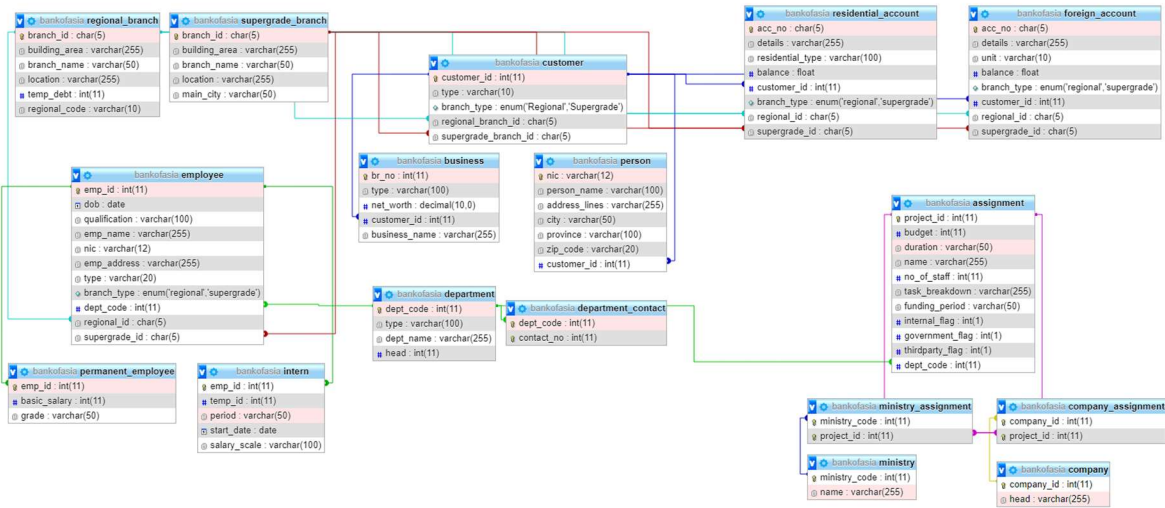


Figure 2 – Mapping

4. User roles

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

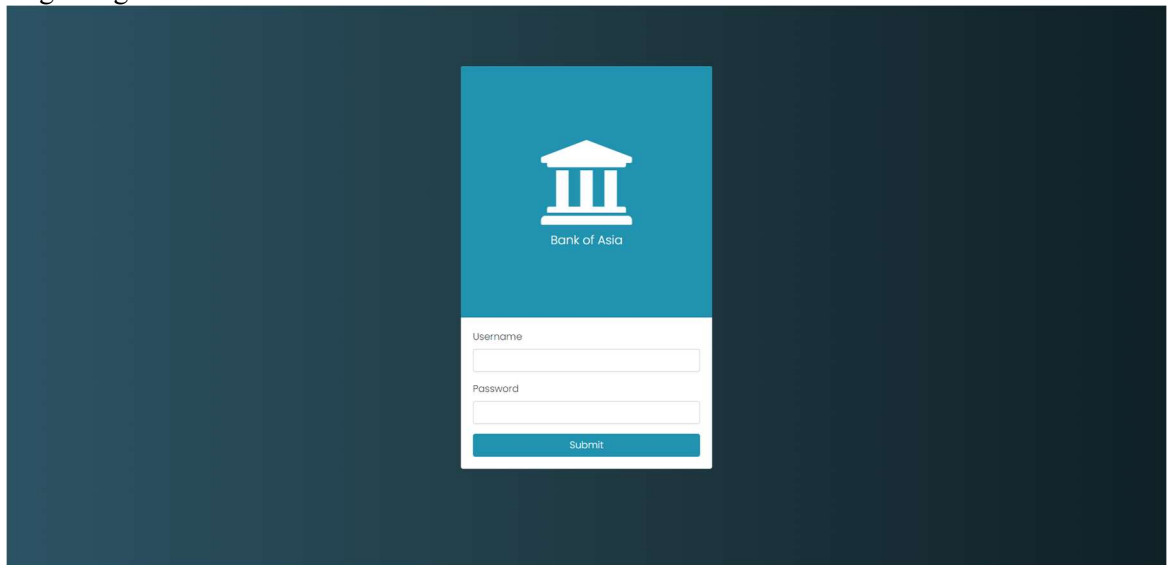


Figure 3 - Login Page

2. Home Page

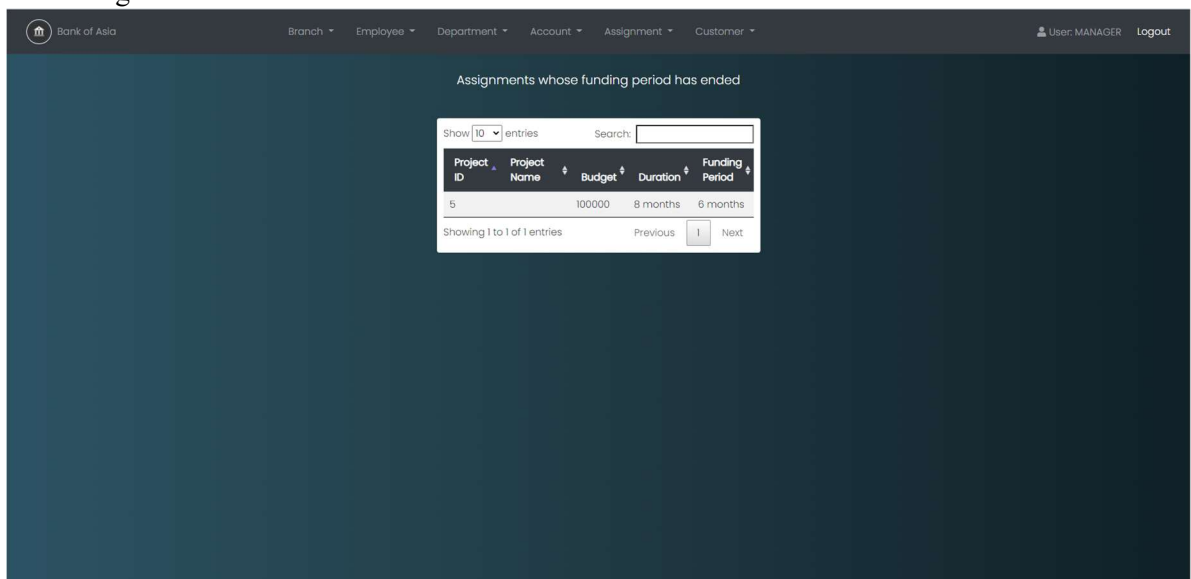


Figure 4 - Home Page

3. Insertion of data

The screenshot shows a web application interface for 'Bank of Asia'. The top navigation bar includes links for Branch, Employee, Department, Account, Assignment, and Customer, along with a user profile icon labeled 'User: MANAGER' and a 'Logout' button. The main content area features a central 'Add Branch' form. This form contains several input fields: 'Branch Id', 'Branch Name', 'Branch Location', 'Building Area', 'Branch Type' (a dropdown menu currently showing 'Choose type...'), 'Temporary debt', 'Regional code', and 'Main city'. A blue 'Submit' button is located at the bottom of the form.

Figure 5 - Form to insert data

4. Deletion of data

The screenshot displays the 'Delete Branch' form and a table of existing branches. The 'Delete Branch' form on the left has fields for 'Branch Id' and 'Branch Type' (a dropdown menu currently showing 'Regional'), with a blue 'Submit' button. To the right, a table titled 'Branches' lists five entries. The table has columns for Branch ID, Branch Name, Branch Location, Building Area, and Type. Below the table, there is a pagination bar showing 'Showing 1 to 5 of 5 entries' and navigation buttons for 'Previous', '1', and 'Next'.

Branch ID	Branch Name	Branch Location	Building Area	Type
B001	Branch A	Colombo, Sri Lanka	Top floor	Regional
B002	Head Office	Town Hall	Top floor	Supergrade
B003	Kallupitiya A	Colombo 08	North Wing	Regional
B004	Branch C	Colombo 05	North Wing	Regional
B005	Colombo Super	Colombo, Sri Lanka	North Wing	Regional

Figure 6 - Form for deletion of data

5. Updating of data

Update Branch

Branch ID:

Branch Type:

Update Field:

Update Field:

Enter new value:

Regional Branches

Show 10 entries Search:

Branch ID	Branch Name	Branch Location	Building Area	Temporary Debt	Regional Code
B001	Branch A	Colombo, Sri Lanka	Top floor	50000	Reg001
B003	Kollupitiya A	Colombo 08	North Wing	100000	Reg003
B004	Branch C	Colombo 05	North Wing	4000	Reg004
B005	Colombo Super	Colombo, Sri Lanka	North Wing	85000	Reg005

Showing 1 to 4 of 4 entries Previous 1 Next

Supergrade Branches

Show 10 entries Search:

Branch ID	Branch Name	Branch Location	Building Area	Main City
B002	Head Office	Town Hall	Top floor	Town Hall

Showing 1 to 1 of 1 entries Previous 1 Next

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.

Add Customer

Customer Type:

NIC:

Name:

Address Lines:

City:

Province:

Zip code:

Business Number:

Branches

Show 10 entries Search:

Branch ID	Branch Name	Branch Location	Building Area	Type
B001	Branch A	Colombo, Sri Lanka	Top floor	Regional
B002	Head Office	Town Hall	Top floor	Supergrade
B003	Kollupitiya A	Colombo 08	North Wing	Regional
B004	Branch C	Colombo 05	North Wing	Regional
B005	Colombo Super	Colombo, Sri Lanka	North Wing	Regional
B006	Branch E	Colombo, Sri Lanka	North Wing	Supergrade
B007	Branch Z	Colombo 08	Top floor	Supergrade

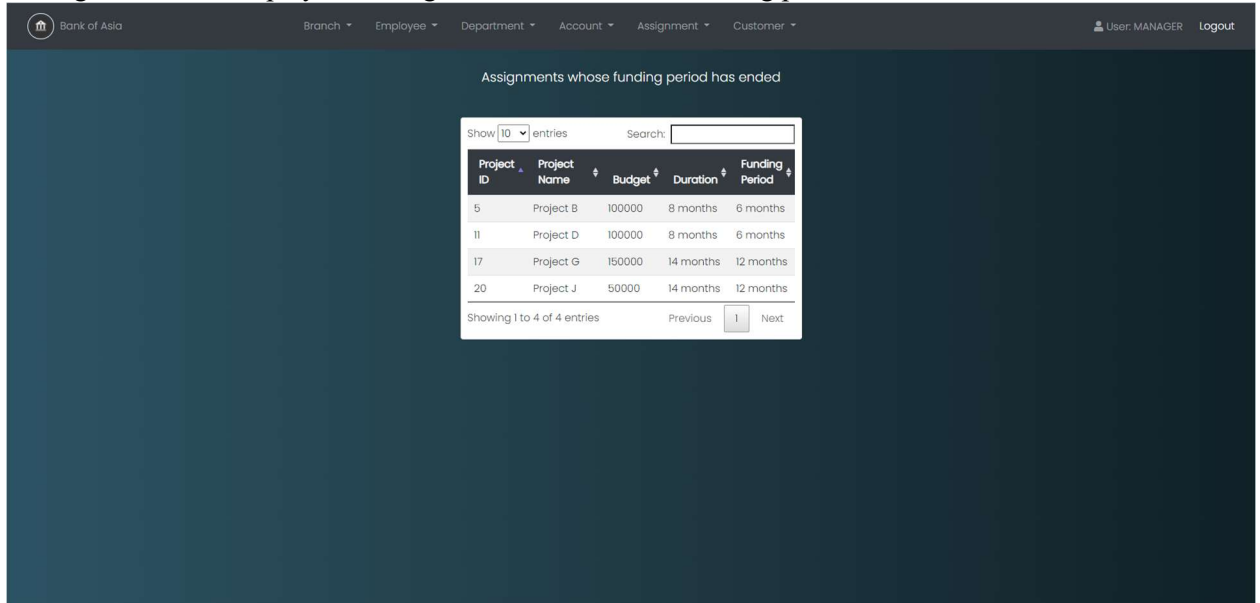
Showing 1 to 7 of 7 entries Previous 1 Next

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

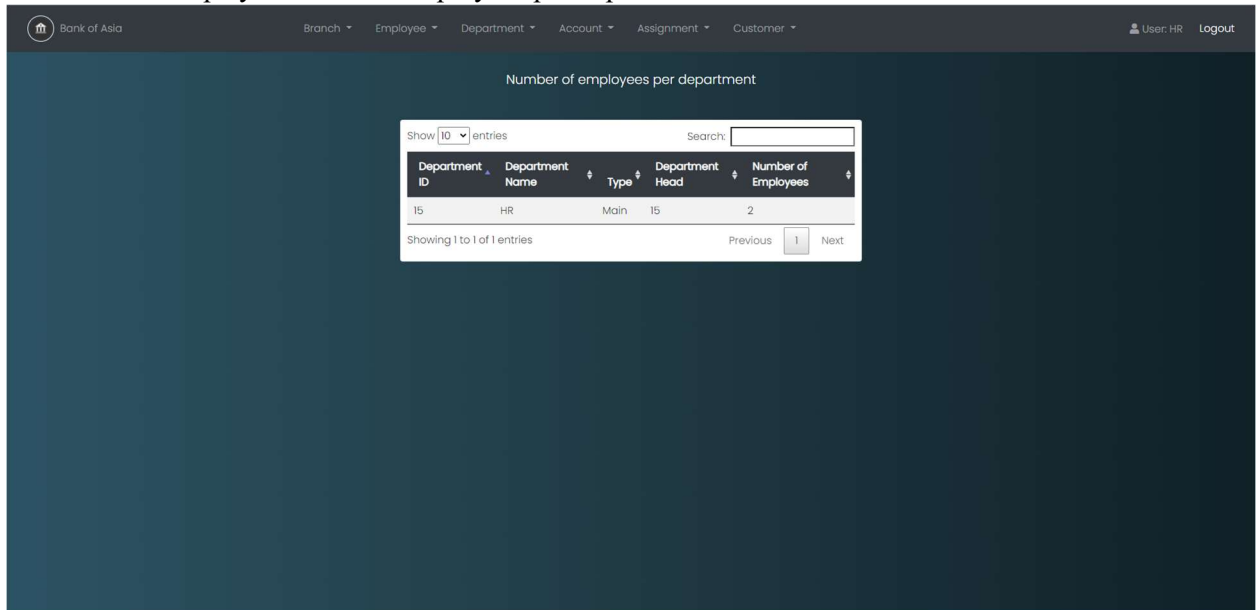


Project ID	Project Name	Budget	Duration	Funding Period
5	Project B	100000	8 months	6 months
11	Project D	100000	8 months	6 months
17	Project G	150000	14 months	12 months
20	Project J	50000	14 months	12 months

Showing 1 to 4 of 4 entries

Figure 9 - Manager's view

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



Department ID	Department Name	Type	Department Head	Number of Employees
15	HR	Main	15	2

Showing 1 to 1 of 1 entries

Figure 10 - HR's view

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

Bank of Asia

Branch Employee Department Account Assignment Customer

User: EMPLOYEE Logout

Foreign accounts per customer

Show 10 entries Search:

Customer ID	Number of Accounts
4	2
8	1
9	1

Showing 1 to 3 of 3 entries Previous 1 Next

Figure 11 - Employee's View

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

Bank of Asia

Branch Employee Department Account Assignment Customer

User: ADMIN Logout

Number of Assignments and Total Budget per Department

Show 10 entries Search:

Department ID	Department Name	Department Type	Department Head	Number of Assignments	Total Budget
15	HR	Main	15	4	450000
16	Finance	Main	5	1	100000
17	IT	Main	6	1	100000

Showing 1 to 3 of 3 entries Previous 1 Next

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.