Project Concept Memo

Project Topic: Simple Contact Management System

The project I propose is a "**Simple Contact Management System.**" This system will allow users to manage their personal and professional contacts efficiently. The primary goal of the system is to provide an easy-to-use interface for users to add, update, and organize their contact information.

Data and Relationships
The system will involve the following main entities:

Users: This table will store information about the users, including UserId, UserName, and Password.

Contacts: This table will store information about the contacts, including ContactId, UserId, ContactName, PhoneNumber, Email, and Address.

Groups: This table will allow users to categorize their contacts, including GroupId, UserId, and GroupName.

ContactGroups: This table will manage the many-to-many relationship between Contacts and Groups, including ContactGroupId, ContactId, and GroupId.

ContactNotes: This table will allow users to add notes to their contacts, including NoteId, ContactId, NoteText, and CreatedAt.

The relationships between these entities are as follows:

- Each user can have multiple contacts.
- Each user can have multiple groups.
- Each contact can belong to multiple groups, and each group can contain multiple contacts (many-to-many relationship).
- Each contact can have multiple notes.

The UserId field in the Contacts and Groups tables will establish the relationship, linking contacts and groups to their respective users. The ContactId and GroupId fields in the ContactGroups table will establish the many-to-many relationship between Contacts and Groups. The ContactId field in the ContactNotes table will link notes to their respective contacts.

The relationship between these entities is straightforward: each user can have multiple contacts. The UserId field in the Contacts table will establish the relationship, linking contacts to their respective users.

Business Rules
To ensure data integrity and enforce business logic, the following business rules will be implemented:

1. **Contact Information Rule:** Each contact must have a name and at least one form of contact information (phone number or email). This rule ensures that each contact entry is useful and complete.

2. **Enforcement:** When a new contact is being added, the system will check if the ContactName field is filled and if at least one of the PhoneNumber or Email fields is filled. If these conditions are not met, an error message will be displayed, and the addition of the contact will be prevented.

3. **Unique Phone Number per User:** A user cannot have two contacts with the same phone number. This rule helps avoid confusion and ensures the uniqueness of each contact.

4. **Enforcement:** When a new contact is being added, the system will check if another contact with the same phone number already exists for the same user. If it does, an error message will be displayed, and the addition of the contact will be prevented.

5. **Email Format Rule:** Each contact's email must be in a valid format. This rule ensures that the email addresses stored are correctly formatted.

6. **Enforcement:** When a new contact is being added or an existing contact is being updated, the system will check if the Email field is in a valid email format. If it is not, an error message will be displayed, and the operation will be prevented.

Conclusion
This project will leverage a structured database to manage contacts efficiently while enforcing simple business rules to maintain data integrity. By implementing these rules, we ensure that the system remains reliable and user-friendly for users. This simple contact management system will help users keep their contact information organized and easily accessible.