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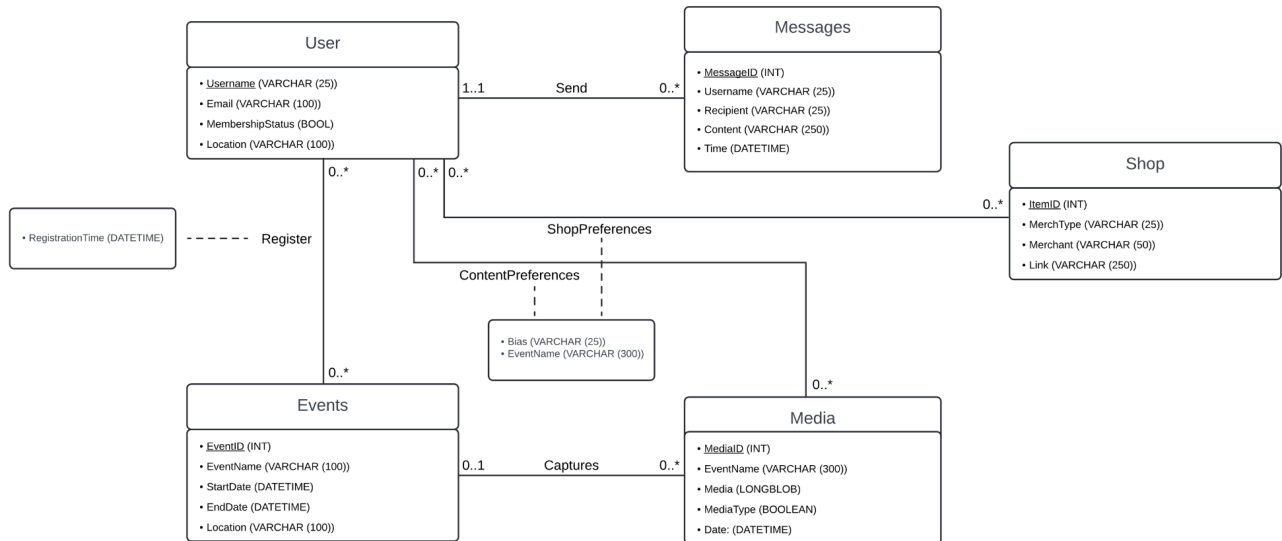
LePhoning

1 UML Diagram

2 Entity Description

- User (info like profile details, settings, notification preferences, etc)

    - Username (VARCHAR (25))

    - Email (VARCHAR (100))

    - MembershipStatus (BOOL)

    - Location (VARCHAR (100))

- Messages (chat messages that are sent/received),

    - MessageID (INT)

    - Username (VARCHAR (25))

    - Recipient (VARCHAR (25))

    - Content (VARCHAR (250))

    - Time (DATETIME)

- Media (stores images and videos pulled from APIs + user uploaded stuff)

    - <u>MediaID</u> (INT)

    - Media (LONGBLOB)

    - MediaType (BOOLEAN)

    - Date (DATETIME)

- Events (upcoming concerts, fan-meets, and calendar system basically)

    - <u>EventID</u> (INT)

    - EventName (VARCHAR (100))

    - StartDate (DATETIME)

    - EndDate (DATETIME)

    - Location (VARCHAR (100))

- Shop:

    - <u>ItemID</u> (INT)

    - MerchType (VARCHAR (25))

    - Merchant (VARCHAR (50))

    - Link (VARCHAR (100))

3   Explanation of Assumptions

- **User** is an entity as it stores the user information which is linked to many other entities in the database. We store the Username as the primary key to uniquely identify each user.

- **Messages** is an entity because it stores the messages sent by each user. We store the MessageID as the primary key to uniquely identify each message and the Username as a foreign key to reference the User relation.

- **Events** is an entity because it stores information about all LE SSERAFIM events. We store the EventID as the primary key to uniquely identify an event.

- **Media** is an entity because it stores information pertaining to all the images and videos accessed by users on the platform. We store the MediaID as the primary key to uniquely identify a media item.

- **Shop** is an entity because it stores information about all items and merchandise that users can browse and purchase externally. We store the ItemID as the primary key to uniquely identify an item in the shop.

- **RegistrationTime** is an attribute to the Registered relationship as users are connected to events by their registration time.

- **Bias** and **EventName** are attributes to the ContentPreferences and ShopPreferences relationships as users can choose what media and merchandise to browse based on their favorite LE SSERAFIM members and events.

- Relationships in the UML diagram:
    - 1-many relationship between **User** and **Messages** as each user can send multiple messages but each message only has one sender.

    - Many-many relationship between **User** and **Events** as each user can register for multiple events and each event can have multiple attendees.

    - Many-many relationship between **User** and **Shop** as each user can have multiple shop preferences and each set of shop preferences is related to multiple users.

    - Many-many relationship between **User** and **Media** because each user can access multiple media items and each media item can be accessed by multiple users.

- 1-many relationship between **Events** and **Media** because each event can have multiple media items that capture it but each media item only captures one event.

4 BCNF Normalization

4.1 User

User:

- <u>Username</u> (VARCHAR (25))
- Email (VARCHAR (100))
- MembershipStatus (BOOL)
- Location (VARCHAR (100))

Functional dependencies:

Username → {Email, MembershipStatus, Location}

BCNF Normalization: Because our primary key is a minimal superkey for the relation, our table is already in BCNF.

4.2 Messages

Messages:

- <u>MessageID</u> (INT)
- Username (VARCHAR (25))
- Recipient (VARCHAR (25))
- Content (VARCHAR (250))
- Time (DATETIME)

Functional dependencies:

MessageID → {Username, Recipient, Content, Time}

BCNF Normalization: Because our primary key is a minimal superkey for the relation, our table is already in BCNF.

4.3   Media

Media:

- <u>MediaID</u> (INT)

- Media (LONGBLOB)

- MediaType (BOOLEAN)

- Date (DATETIME)

Functional dependencies:

MediaID → {Media, MediaType, Date}

BCNF Normalization: Because our primary key is a minimal superkey for the relation, our table is already in BCNF.

4.4   Events

Events:

- <u>EventID</u> (INT)

- EventName (VARCHAR (100))

- StartDate (DATETIME)

- EndDate (DATETIME)

- Location (VARCHAR (100))

Functional Dependencies:

EventID → {EventName, StartDate, EndDate, Location}

BCNF Normalization: Because our primary key is a minimal superkey for the relation, our table is already in BCNF.

4.5 Shop

Shop:

- <u>ItemID</u> (INT)

- MerchType (VARCHAR (25))

- Merchant (VARCHAR (50))

- Link (VARCHAR (100))

Functional dependencies:

ItemID → {MerchType, Merchant, Link}

BCNF Normalization: Because our primary key is a minimal superkey for the relation, our table is already in BCNF.

5   Relational Schema

User(Username: VARCHAR(25)   [PK],   Email: VARCHAR(100), MembershipStatus: BOOL, Location: VARCHAR(100)**)**

Messages(MessageID: INT   [PK], Username: VARCHAR(25) [FK to User.Username], Recipient: VARCHAR(25), Content: VARCHAR (250), Time: DATETIME**)**

Media(MediaID: INT [PK], Media: LONGBLOG, MediaType: BOOLEAN, Date: DATETIME**)**

Events(EventID: INT   [PK],   EventName: VARCHAR(100),   StartDate: DATETIME, EndDate: DATETIME, Location: VARCHAR(100)**)**

Shop(ItemID: INT   [PK],   MerchType: VARCHAR(25),   Merchant: VARCHAR(50), Link: VARCHAR(250)**)**