# Assumptions/Constraints

For this program to work properly, certain assumptions must be true and certain constraints must be met.

1. No two messages can be sent at the exact same time to the exact same contact. This assumption is reasonable because the sent timestamps for texts are accurate to the second. I do not believe it is possible to send two separate text messages to the exact same contact at exactly the same time. (Group texts, however, are sent out to different contacts at exactly the same time.)

# Database Design

The database shall store text message and phone call records. It will also store the timestamps of the last phone call and text message backup(s).

Below is the schema for the tables.

**Contacts**(id, phone\_number, person\_name)

**Phone\_calls**(id, duration, call\_timestamp, contact\_id)

**Text\_messages**(id, msg\_text, received\_timestamp, sender\_id)

**Text\_message\_recipients**(contact\_id, text\_message\_id)

**Last\_backup\_date\_time**(backup\_type, backup\_timestamp)

The text\_message\_recipients table will be the multiway relationship between text\_messages and contacts. This table is needed to store the recipient(s) of a text message. (If all texts had only one recipient, then the recipient id/name could simply be stored in the text\_messages table. However, you must also account for group texts. That is why I created the text\_message\_recipients table.)

The contacts table has the following constraint: all (phone\_number, person\_name) pairs must be unique. This table is in 2NF and 3NF, because a phone\_number does not determine the person\_name (the name of the contact), and person\_name does not determine phone\_number. It is possible that two people share the same phone number. Furthermore, it is possible that there are two contacts named “John”. These two columns combined represent a distinct contact.

(The columns person\_name, backup\_timestamp, backup\_type, msg\_text, and received\_timestamp were so named to avoid using a SQL keyword.)

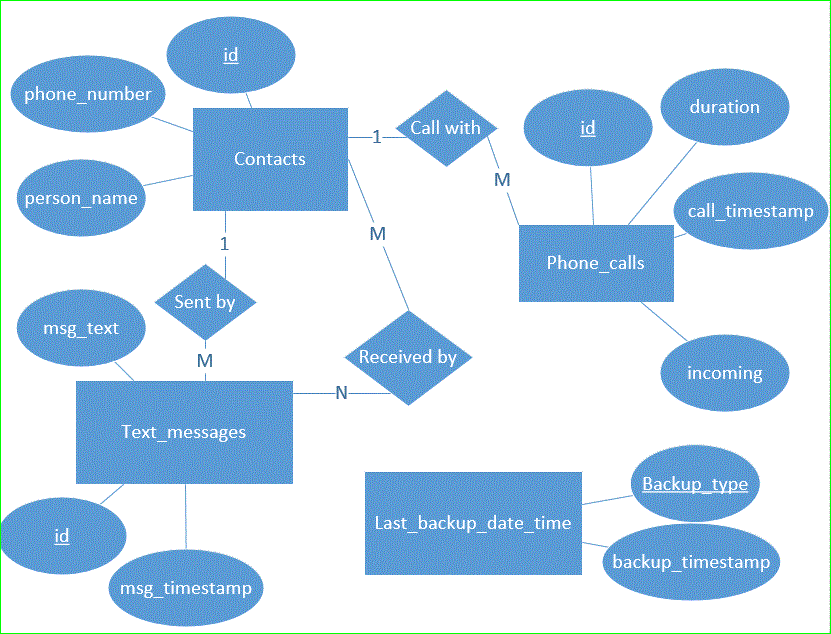


Figure Database Diagram

# Data Dictionary

**backup\_timestamp (timestamp)** – the time that the backup occurred.

**backup\_type (varchar)** – the type of backup performed at the time specified by the backup\_timestamp (acceptable values: “calls” or “texts”).

**call\_timestamp (timestamp)** – the date and time of a phone call. This is when the call first came through to my cell phone (if it was an incoming call) or when I first dialed the call (if it was an outgoing call).

**contact\_id (integer)** – foreign key pointing to the id of the contact that the phone call was made with.

**duration (integer)** – the duration, in seconds, of a phone call. For example: a duration of 131 would mean a phone call that lasted 2 minutes, 11 seconds.

**id (integer)** – the id of a table is an integer that auto increments. It is the primary key. The id of the contacts table, for example, will be unique and will distinguish each contact.

**msg\_text (text)** – the text contained in a text message.

**person\_name (string)** – this is the name of a contact. For example: “Phyllis Milton” could be a person\_name. The person\_name, in combination with the phone\_number, is a unique pair.

**phone\_number (bigint)** – the phone number is an integer. Every contact has at least one phone\_number. A phone\_number can be shared between two contacts. The phone\_number, in combination with the person\_name, is a unique pair.

**received\_timestamp (timestamp)** – the date and time a text message was sent (for outgoing texts) or received (for incoming texts).

**sender\_id (integer)** – foreign key pointing to the id of a contact that sent the text message. If I sent the text message, then this would be my id; if someone sent the text to me, then this would be their id.

**text\_message\_id (integer)** – the id of a text message. In the text\_message\_recipients table, this identifies the text message that a recipient received.