

# LAPORAN PROJECT AKHIR APLIKASI BASIS DATA

## GO DONATE



**Mata Kuliah** : Aplikasi Basis Data

**Jenis Tugas** : Project Akhir

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## Latar Belakang

Perkembangan teknologi informasi mendorong organisasi dan individu untuk mengelola data secara terkomputerisasi. Dalam konteks pengelolaan donasi, sistem manual memiliki banyak kelemahan seperti risiko kesalahan pencatatan, kehilangan data, duplikasi informasi, serta kesulitan dalam memantau status donasi dan total dana yang terkumpul.

Sistem donasi **GoDonate** dirancang sebagai solusi berbasis basis data untuk mengelola proses donasi secara terstruktur, akurat, dan efisien. Dengan adanya basis data relasional, setiap data pengguna, donor, campaign, dan transaksi donasi dapat saling terhubung serta dikelola secara terintegrasi.

## Rumusan Masalah

1. Bagaimana merancang basis data sistem donasi GoDonate?
2. Bagaimana membangun relasi antar tabel menggunakan foreign key?
3. Bagaimana menerapkan perintah SQL DDL dan DML dalam sistem donasi?
4. Bagaimana mengelola dan menghitung total donasi secara otomatis?
5. Bagaimana menampilkan data donasi menggunakan query SELECT, WHERE, dan ORDER BY?

## Screenshot Query (SS Query)

Bagian ini berisi dokumentasi berupa screenshot hasil eksekusi query SQL yang meliputi: - Pembuatan database dan tabel - Pembuatan relasi foreign key - Insert, update, delete data - Query join, aggregate, dan trigger

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## Penjelasan Query dan Fungsinya

### 1. CREATE DATABASE

```
MariaDB [(none)]> create database godonate;  
Query OK, 1 row affected (0.001 sec)  
  
MariaDB [(none)]> _
```

Fungsi: Membuat database baru bernama **godonate** sebagai wadah utama sistem.

### 2. USE DATABASE

```
MariaDB [(none)]> use godonate;  
Database changed  
MariaDB [godonate]>
```

Fungsi: Mengaktifkan database agar dapat digunakan.

### 3. CREATE TABLE users

```
MariaDB [godonate]> CREATE TABLE users (  
-> id BIGINT UNSIGNED AUTO_INCREMENT PRIMARY KEY,  
-> name VARCHAR(100) NOT NULL,  
-> email VARCHAR(100) NOT NULL UNIQUE,  
-> created_at TIMESTAMP NULL DEFAULT CURRENT_TIMESTAMP
```

Fungsi: Menyimpan data akun pengguna.

### 4. CREATE TABLE donors

```
MariaDB [godonate]> CREATE TABLE donors (  
-> id BIGINT UNSIGNED AUTO_INCREMENT PRIMARY KEY,  
-> user_id BIGINT UNSIGNED NULL,  
-> name VARCHAR(100) NOT NULL,  
-> email VARCHAR(100) NOT NULL UNIQUE
```

Fungsi: Menyimpan data donor.

## 5. CREATE TABLE campaign\_statuses

```
MariaDB [godonate]> CREATE TABLE campaign_statuses (  
  ->   id TINYINT UNSIGNED PRIMARY KEY,  
  ->   code VARCHAR(30) NOT NULL UNIQUE  
  -> );  
Query OK, 0 rows affected (0.031 sec)
```

Fungsi: Menyimpan status campaign.

## 6. CREATE TABLE campaigns

```
MariaDB [godonate]> CREATE TABLE campaign_statuses (  
  ->   id TINYINT UNSIGNED PRIMARY KEY,  
  ->   code VARCHAR(30) NOT NULL UNIQUE  
  -> );  
Query OK, 0 rows affected (0.031 sec)
```

Fungsi: Menyimpan data campaign donasi.

## 7. CREATE TABLE donations

```
MariaDB [godonate]> CREATE TABLE donations (  
  ->   id BIGINT UNSIGNED AUTO_INCREMENT PRIMARY KEY,  
  ->   donor_id BIGINT UNSIGNED NOT NULL,  
  ->   campaign_id BIGINT UNSIGNED NOT NULL,  
  ->   amount DECIMAL(15,2) NOT NULL,  
  ->   created_at TIMESTAMP NULL DEFAULT CURRENT_TIMESTAMP  
  -> );  
Query OK, 0 rows affected (0.006 sec)
```

Fungsi: Menyimpan transaksi donasi.

## 8. CREATE TABLE donation\_payments

```
MariaDB [godonate]> CREATE TABLE donation_payments (  
  ->   id BIGINT UNSIGNED AUTO_INCREMENT PRIMARY KEY,  
  ->   donation_id BIGINT UNSIGNED NOT NULL,  
  ->   payment_type VARCHAR(50),  
  ->   status ENUM('pending','paid','failed') DEFAULT 'pending',  
  ->   paid_at TIMESTAMP NULL  
  -> );  
Query OK, 0 rows affected (0.006 sec)
```

Fungsi: Menyimpan status pembayaran donasi

## 9. ADD FOREIGN KEY donors

```
MariaDB [godonate]> ALTER TABLE donations
-> ADD CONSTRAINT fk_donations_campaign
-> FOREIGN KEY (campaign_id)
-> REFERENCES campaigns(id)
-> ON DELETE CASCADE
-> ON UPDATE CASCADE;
Query OK, 0 rows affected (1.060 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [godonate]> ALTER TABLE donation_payments
-> ADD CONSTRAINT fk_payments_donation
-> FOREIGN KEY (donation_id)
-> REFERENCES donations(id)
-> ON DELETE CASCADE
-> ON UPDATE CASCADE;
Query OK, 0 rows affected (0.059 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

Fungsi: Menghubungkan donor dengan user.

## 10. ADD FOREIGN KEY campaigns

```
MariaDB [godonate]> ALTER TABLE donors
-> ADD CONSTRAINT fk_donors_user
-> FOREIGN KEY (user_id)
-> REFERENCES users(id)
-> ON DELETE SET NULL
-> ON UPDATE CASCADE;
Query OK, 0 rows affected (0.057 sec)

MariaDB [godonate]> ALTER TABLE campaigns
-> ADD CONSTRAINT fk_campaigns_status
-> FOREIGN KEY (status_id)
-> REFERENCES campaign_statuses(id)
-> ON DELETE RESTRICT
-> ON UPDATE CASCADE
-> ;
Query OK, 0 rows affected (0.043 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [godonate]> ALTER TABLE donations
-> ADD CONSTRAINT fk_donations_donor
-> FOREIGN KEY (donor_id)
-> REFERENCES donors(id)
-> ON DELETE CASCADE
-> ON UPDATE CASCADE;
Query OK, 0 rows affected (0.042 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

Fungsi: Menghubungkan campaign dengan pembuatnya.



## 11. ADD FOREIGN KEY donations

```
MariaDB [godonate]> ALTER TABLE campaigns
-> ADD CONSTRAINT fk_campaigns_status
-> FOREIGN KEY (status_id)
-> REFERENCES campaign_statuses(id)
-> ON DELETE RESTRICT
-> ON UPDATE CASCADE
-> ;
Query OK, 0 rows affected (0.043 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
MariaDB [godonate]> ALTER TABLE donations
-> ADD CONSTRAINT fk_donations_donor
-> FOREIGN KEY (donor_id)
-> REFERENCES donors(id)
-> ON DELETE CASCADE
-> ON UPDATE CASCADE;
Query OK, 0 rows affected (0.042 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

Fungsi: Menjaga relasi donor dan donasi.

## 12. ADD FOREIGN KEY donation\_payments

```
MariaDB [godonate]> ALTER TABLE campaigns
-> ADD CONSTRAINT fk_campaigns_status
-> FOREIGN KEY (status_id)
-> REFERENCES campaign_statuses(id)
-> ON DELETE RESTRICT
-> ON UPDATE CASCADE
-> ;
Query OK, 0 rows affected (0.043 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
MariaDB [godonate]> ALTER TABLE donations
-> ADD CONSTRAINT fk_donations_donor
-> FOREIGN KEY (donor_id)
-> REFERENCES donors(id)
-> ON DELETE CASCADE
-> ON UPDATE CASCADE;
Query OK, 0 rows affected (0.042 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

Fungsi: Menghubungkan pembayaran dengan donasi.

## 13. SHOW CREATE TABLE

```
godonate | CREATE TABLE `donors` (
  `id` bigint(20) unsigned NOT NULL AUTO_INCREMENT,
  `user_id` bigint(20) unsigned DEFAULT NULL,
  `name` varchar(100) NOT NULL,
  `email` varchar(100) NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE KEY `email` (`email`),
  KEY `fk_donors_user` (`user_id`),
  CONSTRAINT `fk_donors_user` FOREIGN KEY (`user_id`) REFERENCES `users` (`id`) ON DELETE SET NULL ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci |

godonate | SHOW CREATE TABLE campaigns;
+-----+
| Table | Create Table |
+-----+
| campaigns | CREATE TABLE `campaigns` (
  `id` bigint(20) unsigned NOT NULL AUTO_INCREMENT,
  `user_id` bigint(20) unsigned NOT NULL,
  `title` varchar(100) NOT NULL,
  `target_amount` decimal(15,2) NOT NULL,
  `current_amount` decimal(15,2) DEFAULT 0.00,
  `status_id` tinyint(4) unsigned NOT NULL,
  `created_at` timestamp NOT NULL DEFAULT current_timestamp(),
  PRIMARY KEY (`id`),
  KEY `fk_campaigns_user` (`user_id`),
  KEY `fk_campaigns_status` (`status_id`),
  CONSTRAINT `fk_campaigns_status` FOREIGN KEY (`status_id`) REFERENCES `campaign_statuses` (`id`) ON UPDATE CASCADE,
  CONSTRAINT `fk_campaigns_user` FOREIGN KEY (`user_id`) REFERENCES `users` (`id`) ON DELETE CASCADE ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci |
```

Fungsi: Mengecek foreign key dan struktur tabel.

## 14. DESC TABLE

```
MariaDB [godonate]> desc campaign_statuses; desc campaigns; desc donation_payments; desc donations; desc donors; desc users;
```

Field	Type	Null	Key	Default	Extra
id	tinyint(3) unsigned	NO	PRI	NULL	
code	varchar(30)	NO	UNI	NULL	

rows in set (0.012 sec)

Field	Type	Null	Key	Default	Extra
id	bigint(20) unsigned	NO	PRI	NULL	auto_increment
user_id	bigint(20) unsigned	NO	MUL	NULL	
title	varchar(150)	NO		NULL	
target_amount	decimal(15,2)	NO		NULL	
current_amount	decimal(15,2)	YES		0.00	
status_id	tinyint(3) unsigned	NO	MUL	NULL	
created_at	timestamp	YES		current_timestamp()	

rows in set (0.003 sec)

Field	Type	Null	Key	Default	Extra
id	bigint(20) unsigned	NO	PRI	NULL	auto_increment
donation_id	bigint(20) unsigned	NO	MUL	NULL	
payment_type	varchar(50)	YES		NULL	
status	enum('pending','paid','failed')	YES		pending	
paid_at	timestamp	YES		NULL	

rows in set (0.003 sec)

Field	Type	Null	Key	Default	Extra
id	bigint(20) unsigned	NO	PRI	NULL	auto_increment
donor_id	bigint(20) unsigned	NO	MUL	NULL	
campaign_id	bigint(20) unsigned	NO	MUL	NULL	
amount	decimal(15,2)	NO		NULL	
created_at	timestamp	YES		current_timestamp()	

rows in set (0.003 sec)

Fungsi: Melihat struktur kolom tabel.

## 15. CREATE USER

```
MariaDB [godonate]> CREATE USER 'admin_godonate'@'localhost'
-> IDENTIFIED BY 'admin_godonate';
Query OK, 0 rows affected (0.002 sec)

MariaDB [godonate]> CREATE USER 'user_godonate'@'localhost'
-> IDENTIFIED BY 'user_godonate';
Query OK, 0 rows affected (0.002 sec)
```

Fungsi: Membuat user admin.

## 16. GRANT PRIVILEGES

```
MariaDB [godonate]> GRANT ALL PRIVILEGES
-> ON godonate.*
-> TO 'admin_godonate'@'localhost';
Query OK, 0 rows affected (0.001 sec)

MariaDB [godonate]> GRANT SELECT, INSERT, UPDATE ON godonate.* TO 'user_godonate'@'localhost';
Query OK, 0 rows affected (0.001 sec)

MariaDB [godonate]>
```

Fungsi: Memberikan hak akses penuh.

## 17. INSERT USERS

```
MariaDB [godonate]> INSERT INTO users (name, email) VALUES
-> ('Admin GoDonate', 'admin@godonate.com'),
-> ('Yanto Santoso', 'yanto@godonate.com'),
-> ('Siti Aminah', 'siti@godonate.com');
Query OK, 3 rows affected (0.003 sec)
Records: 3 Duplicates: 0 Warnings: 0

MariaDB [godonate]> INSERT INTO donors (user_id, name, email) VALUES
-> (2, 'Yanto Santoso', 'yanto.donor@godonate.com'),
-> (NULL, 'Anonim', 'anonim1@godonate.com'),
-> (3, 'Siti Aminah', 'siti.donor@godonate.com');
Query OK, 3 rows affected (0.003 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

Fungsi: Menambahkan user.

## 18. INSERT DONORS

```
MariaDB [godonate]> INSERT INTO users (name, email) VALUES
-> ('Admin GoDonate', 'admin@godonate.com'),
-> ('Yanto Santoso', 'yanto@godonate.com'),
-> ('Siti Aminah', 'siti@godonate.com');
Query OK, 3 rows affected (0.003 sec)
Records: 3 Duplicates: 0 Warnings: 0

MariaDB [godonate]> INSERT INTO donors (user_id, name, email) VALUES
-> (2, 'Yanto Santoso', 'yanto.donor@godonate.com'),
-> (NULL, 'Anonim', 'anonim1@godonate.com'),
-> (3, 'Siti Aminah', 'siti.donor@godonate.com');
Query OK, 3 rows affected (0.003 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

Fungsi: Menambahkan donor.

## 19. INSERT CAMPAIGN

```
MariaDB [godonate]> INSERT INTO campaigns
-> (user_id, title, target_amount, current_amount, status_id)
-> VALUES
-> (1, 'Bantu Biaya Operasi Anak', 50000000, 15000000, 2),
-> (2, 'Donasi Pendidikan Desa', 30000000, 30000000, 3),
-> (3, 'Bantuan Korban Banjir', 100000000, 25000000, 2);
Query OK, 3 rows affected (0.003 sec)
Records: 3 Duplicates: 0 Warnings: 0

MariaDB [godonate]> INSERT INTO donations
-> (donor_id, campaign_id, amount)
-> VALUES
-> (1, 1, 500000),
-> (2, 1, 250000),
-> (3, 3, 1000000),
-> (1, 3, 750000);
Query OK, 4 rows affected (0.002 sec)
Records: 4 Duplicates: 0 Warnings: 0
```

Fungsi: Menambahkan campaign.



## 20. INSERT DONATION

```
MariaDB [godonate]> INSERT INTO campaigns
  -> (user_id, title, target_amount, current_amount, status_id)
  -> VALUES
  -> (1, 'Bantu Biaya Operasi Anak', 50000000, 15000000, 2),
  -> (2, 'Donasi Pendidikan Desa', 30000000, 30000000, 3),
  -> (3, 'Bantuan Korban Banjir', 100000000, 25000000, 2);
Query OK, 3 rows affected (0.003 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
MariaDB [godonate]> INSERT INTO donations
  -> (donor_id, campaign_id, amount)
  -> VALUES
  -> (1, 1, 500000),
  -> (2, 1, 250000),
  -> (3, 3, 1000000),
  -> (1, 3, 750000);
Query OK, 4 rows affected (0.002 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

Fungsi: Menambahkan data donasi.

## 21. INSERT PAYMENT

```
MariaDB [godonate]> INSERT INTO donation_payments
  -> (donation_id, payment_type, status, paid_at)
  -> VALUES
  -> (1, 'transfer_bank', 'paid', NOW()),
  -> (2, 'ewallet', 'paid', NOW()),
  -> (3, 'qris', 'pending', NULL),
  -> (4, 'transfer_bank', 'paid', NOW());
Query OK, 4 rows affected (0.001 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

Menambahkan status pembayaran.

) Fungsi:

## 22. SELECT DATA

```
MariaDB [godonate]> SELECT * FROM users;
+-----+-----+-----+-----+
| id | name          | email                | created_at          |
+-----+-----+-----+-----+
| 1  | Admin GoDonate | admin@godonate.com   | 2026-01-04 22:46:27 |
| 2  | Yanto Santoso  | yanto@godonate.com   | 2026-01-04 22:46:27 |
| 3  | Siti Aminah    | siti@godonate.com    | 2026-01-04 22:46:27 |
+-----+-----+-----+-----+
3 rows in set (0.001 sec)
```

```
MariaDB [godonate]> SELECT * FROM donors;
+-----+-----+-----+-----+
| id | user_id | name          | email                |
+-----+-----+-----+-----+
| 1  | 2       | Yanto Santoso | yanto.donor@godonate.com |
| 2  | NULL    | Anonim        | anonim1@godonate.com    |
| 3  | 3       | Siti Aminah   | siti.donor@godonate.com  |
+-----+-----+-----+-----+
3 rows in set (0.001 sec)
```



```

MariaDB [godonate]> SELECT * FROM users;
+----+-----+-----+-----+
| id | name       | email                | created_at          |
+----+-----+-----+-----+
| 1  | Admin GoDonate | admin@godonate.com | 2026-01-04 22:46:27 |
| 2  | Yanto Santoso  | yanto@godonate.com | 2026-01-04 22:46:27 |
| 3  | Siti Aminah    | siti@godonate.com  | 2026-01-04 22:46:27 |
+----+-----+-----+-----+
3 rows in set (0.001 sec)

MariaDB [godonate]> SELECT * FROM donors;
+----+-----+-----+-----+
| id | user_id | name       | email                |
+----+-----+-----+-----+
| 1  | 2       | Yanto Santoso | yanto.donor@godonate.com |
| 2  | NULL    | Anonim       | anonim1@godonate.com   |
| 3  | 3       | Siti Aminah  | siti.donor@godonate.com |
+----+-----+-----+-----+
3 rows in set (0.001 sec)

MariaDB [godonate]> SELECT * FROM donations;
+----+-----+-----+-----+
| id | donor_id | campaign_id | amount      | created_at          |
+----+-----+-----+-----+
| 1  | 1        | 1           | 500000.00   | 2026-01-04 22:53:13 |
| 2  | 2        | 1           | 250000.00   | 2026-01-04 22:53:13 |
| 3  | 3        | 3           | 1000000.00  | 2026-01-04 22:53:13 |
| 4  | 1        | 3           | 750000.00   | 2026-01-04 22:53:13 |
+----+-----+-----+-----+
4 rows in set (0.000 sec)

MariaDB [godonate]> SELECT * FROM donation_payments;
+----+-----+-----+-----+
| id | donation_id | payment_type | status | paid_at          |
+----+-----+-----+-----+
| 1  | 1           | transfer_bank | paid   | 2026-01-04 22:54:22 |
| 2  | 2           | ewallet       | paid   | 2026-01-04 22:54:22 |
| 3  | 3           | qris          | pending | NULL             |
| 4  | 4           | transfer_bank | paid   | 2026-01-04 22:54:22 |
+----+-----+-----+-----+
4 rows in set (0.000 sec)

```

Fungsi: Menampilkan data.

## 23. UPDATE USERS

```

MariaDB [godonate]> UPDATE users
  -> SET name = 'Yanti Santi'
  -> WHERE id = 2;
Query OK, 0 rows affected (0.001 sec)
Rows matched: 1  Changed: 0  Warnings: 0

MariaDB [godonate]> SELECT * FROM users
  -> ;
+----+-----+-----+-----+
| id | name       | email                | created_at          |
+----+-----+-----+-----+
| 1  | Admin GoDonate | admin@godonate.com | 2026-01-04 22:46:27 |
| 2  | Yanti Santi    | yanto@godonate.com | 2026-01-04 22:46:27 |
| 3  | Siti Aminah    | siti@godonate.com  | 2026-01-04 22:46:27 |
+----+-----+-----+-----+
3 rows in set (0.000 sec)

```

Fungsi: Mengubah data.

## 24. UPDATE DONORS

```
MariaDB [godonate]> UPDATE donors
  -> SET name = 'Yanti Santi'
  -> WHERE user_id = 2;
Query OK, 1 row affected (0.001 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [godonate]> SELECT * FROM donors;
+----+-----+-----+-----+
| id | user_id | name       | email                               |
+----+-----+-----+-----+
| 1  |      2 | Yanti Santi | yanto.donor@godonate.com          |
| 2  |     NULL | Anonim      | anonim1@godonate.com              |
| 3  |      3 | Siti Aminah | siti.donor@godonate.com            |
+----+-----+-----+-----+
3 rows in set (0.000 sec)
```

Fungsi: Sinkronisasi data.

## 25. DELETE DONORS

```
MariaDB [godonate]> DELETE FROM donors WHERE name = 'Anonim';
Query OK, 1 row affected (0.001 sec)

MariaDB [godonate]> SELECT * FROM donors;
+----+-----+-----+-----+
| id | user_id | name       | email                               |
+----+-----+-----+-----+
| 1  |      2 | Yanti Santi | yanto.donor@godonate.com          |
| 3  |      3 | Siti Aminah | siti.donor@godonate.com            |
+----+-----+-----+-----+
2 rows in set (0.000 sec)
```

Fungsi: Menghapus data.


## 26. RENAME TABLE

```
MariaDB [godonate]> RENAME TABLE donors TO donors_backup;
Query OK, 0 rows affected (0.007 sec)

MariaDB [godonate]> show tables;
+-----+
| Tables_in_godonate |
+-----+
| campaign_statuses  |
| campaigns          |
| donation_payments  |
| donations           |
| donors_backup       |
| users              |
+-----+
6 rows in set (0.001 sec)

MariaDB [godonate]>

donors → donors_backup
```



```
MariaDB [godonate]> RENAME TABLE donors_backup TO donors;
Query OK, 0 rows affected (0.006 sec)

MariaDB [godonate]> show tables;
+-----+
| Tables_in_godonate |
+-----+
| campaign_statuses  |
| campaigns          |
| donation_payments  |
| donations           |
| donors             |
| users              |
+-----+
6 rows in set (0.000 sec)

MariaDB [godonate]>

donors_backup → donors
```

Fungsi: Backup tabel.



## 27. CHANGE COLUMN

```
MariaDB [godonate]> desc campaigns;
+-----+-----+-----+-----+-----+-----+
| Field      | Type                | Null | Key | Default        | Extra          |
+-----+-----+-----+-----+-----+-----+
| id         | bigint(20) unsigned | NO   | PRI | NULL           | auto_increment |
| user_id    | bigint(20) unsigned | NO   | MUL | NULL           |                |
| title      | varchar(150)         | NO   |     | NULL           |                |
| target_amount | decimal(15,2)        | NO   |     | NULL           |                |
| current_amount | decimal(15,2)        | YES  |     | 0.00           |                |
| status_id  | tinyint(3) unsigned | NO   | MUL | NULL           |                |
| created_at | timestamp            | YES  |     | current_timestamp() |                |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.012 sec)

MariaDB [godonate]> ALTER TABLE campaigns CHANGE title campaign_title VARCHAR(150) NOT NULL;
Query OK, 0 rows affected (0.004 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [godonate]> desc campaigns;
+-----+-----+-----+-----+-----+-----+
| Field      | Type                | Null | Key | Default        | Extra          |
+-----+-----+-----+-----+-----+-----+
| id         | bigint(20) unsigned | NO   | PRI | NULL           | auto_increment |
| user_id    | bigint(20) unsigned | NO   | MUL | NULL           |                |
| campaign_title | varchar(150)         | NO   |     | NULL           |                |
| target_amount | decimal(15,2)        | NO   |     | NULL           |                |
| current_amount | decimal(15,2)        | YES  |     | 0.00           |                |
| status_id  | tinyint(3) unsigned | NO   | MUL | NULL           |                |
| created_at | timestamp            | YES  |     | current_timestamp() |                |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.010 sec)

MariaDB [godonate]>
```

Fungsi: Mengubah nama/tipe kolom.

## 28. MODIFY COLUMN

```
MariaDB [godonate]> desc users;
+-----+-----+-----+-----+-----+-----+
| Field      | Type                | Null | Key | Default        | Extra          |
+-----+-----+-----+-----+-----+-----+
| id         | bigint(20) unsigned | NO   | PRI | NULL           | auto_increment |
| name       | varchar(100)         | NO   |     | NULL           |                |
| email      | varchar(100)         | NO   | UNI | NULL           |                |
| created_at | timestamp            | YES  |     | current_timestamp() |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.014 sec)

MariaDB [godonate]> ALTER TABLE users MODIFY email VARCHAR(150) NOT NULL;
Query OK, 0 rows affected (0.004 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [godonate]> desc users;
+-----+-----+-----+-----+-----+-----+
| Field      | Type                | Null | Key | Default        | Extra          |
+-----+-----+-----+-----+-----+-----+
| id         | bigint(20) unsigned | NO   | PRI | NULL           | auto_increment |
| name       | varchar(100)         | NO   |     | NULL           |                |
| email      | varchar(150)         | NO   | UNI | NULL           |                |
| created_at | timestamp            | YES  |     | current_timestamp() |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.016 sec)
```

Fungsi: Mengubah panjang kolom.



## 29. ADD COLUMN

```
MariaDB [godonate]> desc donors;
+-----+-----+-----+-----+-----+-----+
| Field | Type                | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id    | bigint(20) unsigned | NO   | PRI | NULL    | auto_increment |
| user_id | bigint(20) unsigned | YES  | MUL | NULL    |                |
| name  | varchar(100)        | NO   |     | NULL    |                |
| email | varchar(100)        | NO   | UNI | NULL    |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.012 sec)

MariaDB [godonate]> ALTER TABLE donors
-> ADD phone VARCHAR(20) AFTER email;
Query OK, 0 rows affected (0.006 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [godonate]> desc donors;
+-----+-----+-----+-----+-----+-----+
| Field | Type                | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id    | bigint(20) unsigned | NO   | PRI | NULL    | auto_increment |
| user_id | bigint(20) unsigned | YES  | MUL | NULL    |                |
| name  | varchar(100)        | NO   |     | NULL    |                |
| email | varchar(100)        | NO   | UNI | NULL    |                |
| phone | varchar(20)         | YES  |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.012 sec)

MariaDB [godonate]>
```

Fungsi: Menambah kolom.

## 30. DROP COLUMN

```
MariaDB [godonate]> desc donors;
+-----+-----+-----+-----+-----+-----+
| Field | Type                | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id    | bigint(20) unsigned | NO   | PRI | NULL    | auto_increment |
| user_id | bigint(20) unsigned | YES  | MUL | NULL    |                |
| name  | varchar(100)        | NO   |     | NULL    |                |
| email | varchar(100)        | NO   | UNI | NULL    |                |
| phone | varchar(20)         | YES  |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.012 sec)

MariaDB [godonate]> ALTER TABLE donors
-> DROP phone;
Query OK, 0 rows affected (0.004 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [godonate]> desc donors;
+-----+-----+-----+-----+-----+-----+
| Field | Type                | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| id    | bigint(20) unsigned | NO   | PRI | NULL    | auto_increment |
| user_id | bigint(20) unsigned | YES  | MUL | NULL    |                |
| name  | varchar(100)        | NO   |     | NULL    |                |
| email | varchar(100)        | NO   | UNI | NULL    |                |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.012 sec)

MariaDB [godonate]>
```

Fungsi: Menghapus kolom.

### 31. SELECT BETWEEN

```
MariaDB [godonate]> SELECT * FROM donations WHERE amount BETWEEN 700000 AND 1000000;
+-----+-----+-----+-----+-----+
| id | donor_id | campaign_id | amount | created_at |
+-----+-----+-----+-----+-----+
| 3 | 3 | 3 | 1000000.00 | 2026-01-04 22:53:13 |
| 4 | 1 | 3 | 750000.00 | 2026-01-04 22:53:13 |
+-----+-----+-----+-----+-----+
2 rows in set (0.000 sec)

MariaDB [godonate]>
```

Fungsi: Menampilkan donasi tertentu.

### 32. TRIGGER DONASI MASUK

```
MariaDB [godonate]> CREATE TRIGGER trg_after_payment_paid
-> AFTER UPDATE ON donation_payments
-> FOR EACH ROW
-> BEGIN
->     IF NEW.status = 'paid' AND OLD.status <> 'paid' THEN
->         UPDATE campaigns
->         SET current_amount = current_amount + (
->             SELECT amount
->             FROM donations
->             WHERE id = NEW.donation_id
->         )
->         WHERE id = (
->             SELECT campaign_id
->             FROM donations
->             WHERE id = NEW.donation_id
->         );
->     END IF;
-> END$$
Query OK, 0 rows affected (0.006 sec)
```

### TESTING TRIGGER DONASI MASUK

```
MariaDB [godonate]> SELECT id, campaign_title, current_amount
-> FROM campaigns
-> WHERE id = 3;
+-----+-----+-----+
| id | campaign_title | current_amount |
+-----+-----+-----+
| 3 | Bantuan Korban Banjir | 25000000.00 |
+-----+-----+-----+
1 row in set (0.000 sec)
```

```
MariaDB [godonate]> UPDATE donation_payments
-> SET status = 'paid', paid_at = NOW()
-> WHERE id = 3;
Query OK, 1 row affected (0.003 sec)
Rows matched: 1 Changed: 1 Warnings: 0
```

```
MariaDB [godonate]> SELECT id, campaign_title, current_amount
-> FROM campaigns
-> WHERE id = 3;
+-----+-----+-----+
| id | campaign_title | current_amount |
+-----+-----+-----+
| 3 | Bantuan Korban Banjir | 26000000.00 |
+-----+-----+-----+
1 row in set (0.000 sec)
```

```
MariaDB [godonate]>
```

```
MariaDB [godonate]> SELECT * FROM donation_payments;
+-----+-----+-----+-----+-----+
| id | donation_id | payment_type | status | paid_at |
+-----+-----+-----+-----+-----+
| 1 | 1 | transfer_bank | paid | 2026-01-04 22:54:22 |
| 2 | 2 | ewallet | paid | 2026-01-04 22:54:22 |
| 3 | 3 | qris | pending | NULL |
| 4 | 4 | transfer_bank | paid | 2026-01-04 22:54:22 |
+-----+-----+-----+-----+-----+
4 rows in set (0.000 sec)
```



```
MariaDB [godonate]> select * from donation_payments;
+-----+-----+-----+-----+-----+
| id | donation_id | payment_type | status | paid_at |
+-----+-----+-----+-----+-----+
| 1 | 1 | transfer_bank | paid | 2026-01-04 22:54:22 |
| 3 | 3 | qris | paid | 2026-01-05 01:11:16 |
| 4 | 4 | transfer_bank | paid | 2026-01-04 22:54:22 |
| 5 | 5 | ewallet | paid | 2026-01-05 01:21:32 |
+-----+-----+-----+-----+-----+
```

Fungsi: Menambah total donasi otomatis.

### 33. TRIGGER DONASI GAGAL

```
MariaDB [godonate]> CREATE TRIGGER trg_after_payment_failed
-> AFTER UPDATE ON donation_payments
-> FOR EACH ROW
-> BEGIN
->     IF OLD.status = 'paid' AND NEW.status = 'failed' THEN
->         UPDATE campaigns
->         SET current_amount = current_amount - (
->             SELECT amount
->             FROM donations
->             WHERE id = NEW.donation_id
->         )
->         WHERE id = (
->             SELECT campaign_id
->             FROM donations
->             WHERE id = NEW.donation_id
->         );
->     END IF;
-> END$$
Query OK, 0 rows affected (0.006 sec)
```

### TESTING TRIGGER DONASI GAGAL

```
MariaDB [godonate]> SELECT id, campaign_title, current_amount
-> FROM campaigns
-> WHERE id = 3;
+----+-----+-----+
| id | campaign_title | current_amount |
+----+-----+-----+
| 3  | Bantuan Korban Banjir | 26000000.00 |
+----+-----+-----+
1 row in set (0.000 sec)
```

```
MariaDB [godonate]> UPDATE donation_payments
-> SET status = 'failed'
-> WHERE id = 3;
Query OK, 1 row affected (0.004 sec)
Rows matched: 1 Changed: 1 Warnings: 0
```

```
MariaDB [godonate]> SELECT id, campaign_title, current_amount
-> FROM campaigns
-> WHERE id = 3;
+----+-----+-----+
| id | campaign_title | current_amount |
+----+-----+-----+
| 3  | Bantuan Korban Banjir | 25000000.00 |
+----+-----+-----+
1 row in set (0.000 sec)
```

MariaDB [godonate]>

```
MariaDB [godonate]> select * from donation_payments;
+----+-----+-----+-----+-----+
| id | donation_id | payment_type | status | paid_at |
+----+-----+-----+-----+-----+
| 1  | 1           | transfer_bank | paid   | 2026-01-04 22:54:22 |
| 3  | 3           | qris          | paid   | 2026-01-05 01:11:16 |
| 4  | 4           | transfer_bank | paid   | 2026-01-04 22:54:22 |
| 5  | 5           | ewallet       | paid   | 2026-01-05 01:21:32 |
+----+-----+-----+-----+-----+
```



```
MariaDB [godonate]> SELECT * FROM donation_payments;
+----+-----+-----+-----+-----+
| id | donation_id | payment_type | status | paid_at |
+----+-----+-----+-----+-----+
| 1  | 1           | transfer_bank | paid   | 2026-01-04 22:54:22 |
| 3  | 3           | qris          | failed | 2026-01-05 01:11:16 |
| 4  | 4           | transfer_bank | paid   | 2026-01-04 22:54:22 |
| 5  | 5           | ewallet       | paid   | 2026-01-05 01:21:32 |
+----+-----+-----+-----+-----+
4 rows in set (0.000 sec)
```

Fungsi: Mengurangi donasi otomatis.



### 34. INNER JOIN

```
MariaDB [godonate]> SELECT
->     c.id,
->     c.campaign_title,
->     u.name AS creator,
->     cs.code AS status
-> FROM campaigns c
-> INNER JOIN users u ON c.user_id = u.id
-> INNER JOIN campaign_statuses cs ON c.status_id = cs.id;
```

id	campaign_title	creator	status
1	Bantu Biaya Operasi Anak	Admin GoDonate	active
2	Donasi Pendidikan Desa	Yanti Santi	closed
3	Bantuan Korban Banjir	Siti Aminah	active

Fungsi: Menampilkan data relasional.

### 35. LEFT JOIN

```
MariaDB [godonate]> SELECT
->     d.id,
->     d.name AS donor_name,
->     u.name AS user_name
-> FROM donors d
-> LEFT JOIN users u ON d.user_id = u.id;
```

id	donor_name	user_name
1	Yanti Santi	Yanti Santi
3	Siti Aminah	Siti Aminah

Fungsi: Menampilkan semua dono

### 36. RIGHT JOIN

```
MariaDB [godonate]> SELECT
->     u.id,
->     u.name,
->     d.id AS donor_id
-> FROM donors d
-> RIGHT JOIN users u ON d.user_id = u.id;
```

id	name	donor_id
1	Admin GoDonate	NULL
2	Yanti Santi	1
3	Siti Aminah	3

3 rows in set (0.001 sec)

Fungsi: Menampilkan semua user.

### 37. SUM & GROUP BY

```
MariaDB [godonate]> SELECT
->     c.campaign_title,
->     SUM(d.amount) AS total_donasi
-> FROM donations d
-> JOIN campaigns c ON d.campaign_id = c.id
-> GROUP BY c.id;
```

campaign_title	total_donasi
Bantu Biaya Operasi Anak	750000.00
Bantuan Korban Banjir	1750000.00

2 rows in set (0.002 sec)

Fungsi: Total donasi per campaign.

### 38. CREATE VIEW

```
MariaDB [godonate]> CREATE VIEW view_campaign_donations AS
-> SELECT
->     c.campaign_title,
->     SUM(d.amount) AS total_donasi
-> FROM donations d
-> JOIN campaigns c ON d.campaign_id = c.id
-> GROUP BY c.id;
```

Query OK, 0 rows affected (0.002 sec)

```
MariaDB [godonate]> SELECT * FROM view_campaign_donations;
```

campaign_title	total_donasi
Bantu Biaya Operasi Anak	750000.00
Bantuan Korban Banjir	1750000.00

2 rows in set (0.001 sec)

Fungsi: Menyimpan query laporan.

### 39. ORDER BY

```
MariaDB [godonate]> SELECT
->     c.campaign_title,
->     SUM(d.amount) AS total_donasi
-> FROM donations d
-> JOIN campaigns c ON d.campaign_id = c.id
-> GROUP BY c.id
-> ORDER BY total_donasi DESC;
```

campaign_title	total_donasi
Bantuan Korban Banjir	1750000.00
Bantu Biaya Operasi Anak	750000.00

2 rows in set (0.041 sec)

Fungsi: Mengurutkan data.



## 40. CURDATE

Contoh, Donasi Hari ini:

```
MariaDB [godonate]> SELECT *  
-> FROM campaigns  
-> WHERE DATE(created_at) = CURDATE();  
Empty set (0.002 sec)
```

Contoh, Donasi Kemarin :

```
MariaDB [godonate]> SELECT *  
-> FROM campaigns  
-> WHERE DATE(created_at) = CURDATE() - INTERVAL 1 DAY;
```

id	user_id	campaign_title	target_amount	current_amount	status_id	created_at
1	1	Bantu Biaya Operasi Anak	50000000.00	15000000.00	2	2026-01-04 22:53:05
2	2	Donasi Pendidikan Desa	30000000.00	30000000.00	3	2026-01-04 22:53:05
3	3	Bantuan Korban Banjir	100000000.00	25000000.00	2	2026-01-04 22:53:05

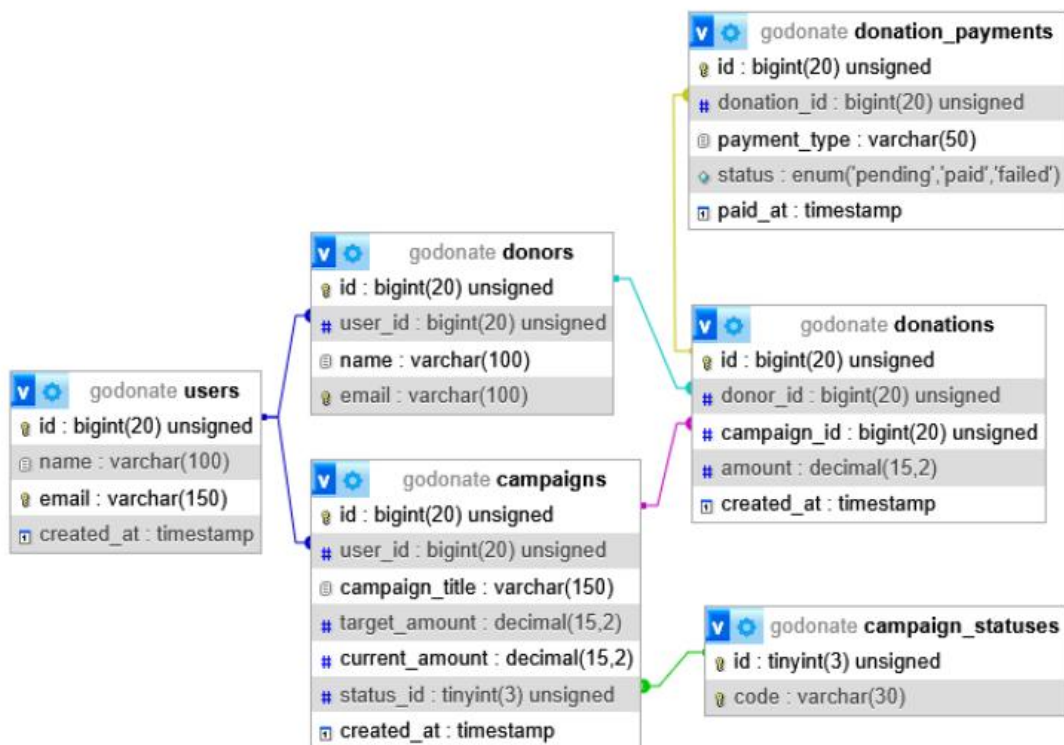
3 rows in set (0.000 sec)

```
MariaDB [godonate]> _
```

Fungsi: Menampilkan donasi hari ini.

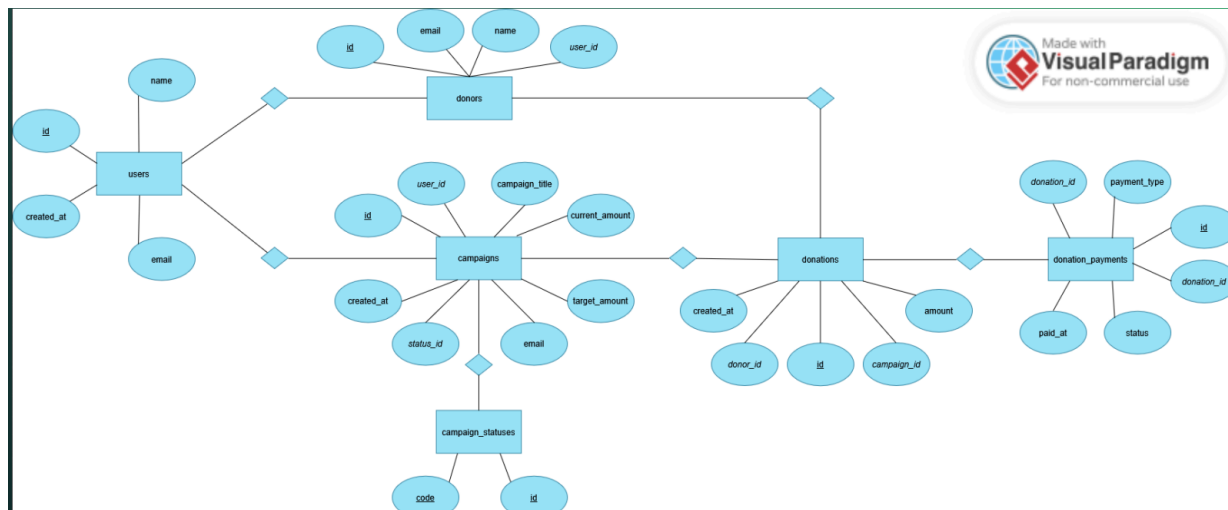
## Struktur Database

Struktur database menggambarkan susunan tabel yang digunakan dalam sistem GoDonate beserta keterkaitan antar tabel secara keseluruhan.



## Entity Relationship Diagram (ERD)

Entity Relationship Diagram (ERD) digunakan untuk menggambarkan struktur basis data GoDonate beserta hubungan antar tabel secara konseptual. ERD ini menunjukkan entitas, atribut, serta relasi antar tabel yang digunakan dalam sistem donasi.



## Spesifikasi File / Tabel Basis Data

Spesifikasi file digunakan untuk menjelaskan struktur detail dan karakteristik setiap tabel dalam basis data GoDonate, meliputi informasi teknis dan fungsi penyimpanan data.

### 1. File / Tabel users

- **Nama File** : users
- **Akronim** : USR
- **Fungsi** : Menyimpan data pengguna sistem GoDonate
- **Tipe File** : Master
- **Organisasi File** : Indexed Sequential
- **Akses File** : Read, Insert, Update, Delete
- **Media** : Harddisk / SSD
- **Software** : MySQL / MariaDB
- **Panjang Record** : Variabel
- **Kunci Field** : id

No	Field	Tipe Data	Panjang	Keterangan
1	id	INT	11	Primary Key
2	name	VARCHAR	100	Nama pengguna
3	email	VARCHAR	100	Email pengguna
4	password	VARCHAR	255	Password pengguna
5	created_at	DATETIME	-	Tanggal pembuatan akun

## 2. File / Tabel donors

- **Nama File** : donors
- **Akronim** : DNR
- **Fungsi** : Menyimpan data pendonor
- **Tipe File** : Master
- **Organisasi File** : Indexed Sequential
- **Akses File** : Read, Insert, Update, Delete
- **Media** : Harddisk / SSD
- **Software** : MySQL / MariaDB
- **Panjang Record** : Variabel
- **Kunci Field** : id

No	Field	Tipe Data	Panjang	Keterangan
1	id	INT	11	Primary Key
2	user_id	INT	11	Foreign Key ke users
3	name	VARCHAR	100	Nama donor

## 3. File / Tabel campaigns

- **Nama File** : campaigns
- **Akronim** : CMP
- **Fungsi** : Menyimpan data campaign donasi
- **Tipe File** : Master
- **Organisasi File** : Indexed Sequential
- **Akses File** : Read, Insert, Update, Delete
- **Media** : Harddisk / SSD
- **Software** : MySQL / MariaDB
- **Panjang Record** : Variabel
- **Kunci Field** : id

No	Field	Tipe Data	Panjang	Keterangan
1	id	INT	11	Primary Key
2	user_id	INT	11	Foreign Key ke users
3	status_id	INT	11	Foreign Key ke campaign_statuses
4	title	VARCHAR	150	Judul campaign
5	total_donation	BIGINT	-	Total donasi



#### 4. File / Tabel donations

- **Nama File** : donations
- **Akronim** : DNT
- **Fungsi** : Menyimpan transaksi donasi
- **Tipe File** : Transaksi
- **Organisasi File** : Sequential
- **Akses File** : Read, Insert, Update, Delete
- **Media** : Harddisk / SSD
- **Software** : MySQL / MariaDB
- **Panjang Record** : Variabel
- **Kunci Field** : id

No	Field	Tipe Data	Panjang	Keterangan
1	id	INT	11	Primary Key
2	donor_id	INT	11	Foreign Key ke donors
3	campaign_id	INT	11	Foreign Key ke campaigns
4	amount	BIGINT	-	Nominal donasi
5	created_at	DATETIME	-	Tanggal donasi

#### 5. File / Tabel donation\_payments

- **Nama File** : donation\_payments
- **Akronim** : DPM
- **Fungsi** : Menyimpan status pembayaran donasi
- **Tipe File** : Transaksi
- **Organisasi File** : Sequential
- **Akses File** : Read, Insert, Update, Delete
- **Media** : Harddisk / SSD
- **Software** : MySQL / MariaDB
- **Panjang Record** : Variabel
- **Kunci Field** : id

No	Field	Tipe Data	Panjang	Keterangan
1	id	INT	11	Primary Key
2	donation_id	INT	11	Foreign Key ke donations
3	status	VARCHAR	50	Status pembayaran

## Tabel Otomatisasi Sistem

Tabel otomatisasi sistem digunakan untuk menjelaskan proses-proses yang berjalan secara otomatis pada sistem GoDonate, khususnya yang melibatkan interaksi antar objek/tabel basis data serta penggunaan trigger dan query SQL untuk menjaga konsistensi data.

No	Objek / Kelas yang Berinteraksi	Keterangan Alur	Metode Otomatisasi
1	donations → campaigns	Setiap kali data donasi baru berhasil disimpan, sistem akan menambahkan nominal donasi ke total_donation pada tabel campaign terkait.	Trigger AFTER INSERT
2	donation_payments → donations	Perubahan status pembayaran memengaruhi validasi transaksi donasi.	UPDATE dengan kondisi status
3	users → donors	Data user yang berperan sebagai donor akan direlasikan secara otomatis melalui foreign key.	Relasi Foreign Key
4	donations → donation_payments	Setiap transaksi donasi akan otomatis memiliki data pembayaran terkait.	INSERT terhubung (relasional)
5	campaigns → laporan donasi	Data campaign dan donasi digabungkan untuk kebutuhan laporan.	SELECT JOIN & AGGREGATE

No	Fungsionalitas yang Diuji	Hasil yang Diharapkan	Status
1	Pembuatan database GoDonate	Database berhasil dibuat dan dapat diakses	Berhasil
2	Pembuatan tabel users	Tabel users terbentuk sesuai struktur	Berhasil
3	Pembuatan tabel donors	Tabel donors terbentuk dan terhubung ke users	Berhasil
4	Pembuatan tabel campaigns	Tabel campaigns terbentuk dengan foreign key	Berhasil
No	Fungsionalitas yang Diuji	Hasil yang Diharapkan	Status
5	Insert data user	Data user berhasil disimpan	Berhasil
6	Insert data donor	Data donor berhasil disimpan	Berhasil
7	Insert data campaign	Campaign baru berhasil ditambahkan	Berhasil
8	Insert data donasi	Data donasi tercatat pada tabel donations	Berhasil
9	Trigger donasi masuk	Total donasi campaign bertambah otomatis	Berhasil
10	View laporan donasi	Data laporan tampil sesuai query view	Berhasil

## Tabel Arsitektur Deployment

Tabel arsitektur deployment digunakan untuk menjelaskan lingkungan sistem yang digunakan dalam menjalankan aplikasi dan basis data GoDonate, termasuk peran masing-masing komponen.

No	Komponen	Lingkungan yang Digunakan	Peran
1	Client / Browser	Google Chrome / Mozilla Firefox	Mengakses aplikasi GoDonate melalui antarmuka web
2	Web Server Lokal	Laptop (Localhost)	Menjalankan aplikasi GoDonate secara lokal
3	Database Server	MySQL / MariaDB (Localhost)	Menyimpan dan mengelola basis data GoDonate
4	Tunneling Service	Ngrok	Menghubungkan server lokal ke internet publik
5	Hosting	Ngrok (Laptop sebagai server)	Menyediakan akses online sementara ke aplikasi GoDonate

## Deskripsi Alur Proses GoDonate

Deskripsi alur proses ini menjelaskan bagaimana mekanisme donasi berjalan pada sistem GoDonate, baik dari sisi pengguna (member maupun non-member) maupun dari sisi admin.

### Alur Donasi oleh Pengguna (Member dan Non-Member)

1. Pengguna mengakses website GoDonate melalui browser.
2. Pengguna dapat melihat daftar campaign donasi tanpa harus login (non-member).
3. Pengguna memilih campaign yang ingin didonasikan.
4. Pengguna mengisi form donasi yang berisi nama donor, nominal donasi, dan metode pembayaran.
5. Sistem mencatat data donasi ke dalam tabel **donations**.
6. Sistem mencatat status pembayaran ke dalam tabel **donation\_payments**.
7. Trigger database akan berjalan secara otomatis untuk menambahkan total donasi pada tabel **campaigns**.
8. Donasi berhasil diproses dan data tersimpan di dalam basis data.

### Alur Donasi oleh Member (Login)

1. Member melakukan login ke sistem GoDonate.
2. Member memilih campaign yang tersedia.
3. Member melakukan donasi melalui form donasi.
4. Sistem mencatat transaksi donasi dan mengaitkannya dengan akun member.
5. Status pembayaran diperbarui sesuai proses transaksi.

### Alur Proses Admin

1. Admin melakukan login ke sistem.
2. Admin mengelola data campaign (tambah, ubah, hapus).
3. Admin memantau data donasi yang masuk.
4. Admin memverifikasi status pembayaran donasi.
5. Admin melihat laporan donasi melalui query view.



6. Admin memastikan data donasi tersimpan dengan benar di basis data.

## Kesimpulan

Berdasarkan hasil perancangan dan implementasi basis data pada sistem **GoDonate**, dapat disimpulkan bahwa sistem basis data berhasil dibangun menggunakan konsep basis data relasional. Struktur tabel yang saling terhubung melalui foreign key mampu menjaga konsistensi dan integritas data. Penerapan perintah DDL dan DML memudahkan proses pengelolaan struktur maupun isi data, sedangkan penggunaan trigger membantu otomatisasi perhitungan total donasi secara real-time. Selain itu, query JOIN, GROUP BY, dan VIEW mendukung penyajian laporan donasi secara terstruktur dan informatif.

## Kelebihan

1. Struktur basis data terorganisir dengan baik menggunakan relasi foreign key.
2. Pengelolaan data dilakukan menggunakan perintah DDL dan DML yang lengkap.
3. Trigger mampu mengotomatisasi penambahan dan pengurangan total donasi.
4. Query JOIN memudahkan pengambilan data dari beberapa tabel sekaligus.
5. Sistem mendukung pembuatan laporan donasi secara efisien dan terintegrasi.

## Kekurangan

1. Aspek keamanan database belum dibahas secara mendalam.
2. Sistem belum dioptimalkan untuk transaksi berskala besar (high traffic).
3. Validasi data masih terbatas pada level database.
4. Belum terdapat mekanisme backup dan recovery data secara otomatis.

## Batasan Sistem GoDonate

Berdasarkan perancangan dan implementasi sistem basis data GoDonate, terdapat beberapa batasan (limitations) yang perlu diperhatikan dalam pengembangan dan penggunaan sistem ini, antara lain:

1. Sistem GoDonate masih berfokus pada pengelolaan data donasi dari sisi basis data, sehingga belum mencakup pengembangan antarmuka pengguna (UI/UX) secara mendalam.
2. Proses pembayaran donasi belum terintegrasi langsung dengan payment gateway nyata (seperti e-wallet atau virtual account), sehingga status pembayaran masih bersifat simulasi pada level database.
3. Keamanan basis data masih terbatas pada pengaturan hak akses dasar dan belum mencakup enkripsi data sensitif secara lanjutan.
4. Sistem belum mendukung pengelolaan donasi dalam jumlah transaksi yang sangat besar (high concurrency).
5. Fitur pelaporan masih terbatas pada query SQL (SELECT, JOIN, AGGREGATE, dan VIEW) dan belum disajikan dalam bentuk dashboard visual.
6. Sistem belum memiliki mekanisme backup dan recovery database secara otomatis.
7. Akses aplikasi masih bersifat lokal dengan bantuan tunneling (ngrok), sehingga bergantung pada koneksi dan ketersediaan perangkat pengembang.

## Penutup

Dengan adanya perancangan basis data sistem **GoDonate**, diharapkan proses pengelolaan donasi dapat dilakukan secara lebih efektif, akurat, dan transparan. Sistem ini dapat dijadikan sebagai dasar untuk pengembangan aplikasi donasi berbasis web atau mobile di masa mendatang dengan menambahkan fitur keamanan, optimasi performa, serta antarmuka pengguna yang lebih interaktif.