Cafe Management System

Vishal Gandla(Manager)
Bhumika Gupta
Prathyusha Kurapati
Pooja Dulam
Shriya Garlapati

Introduction

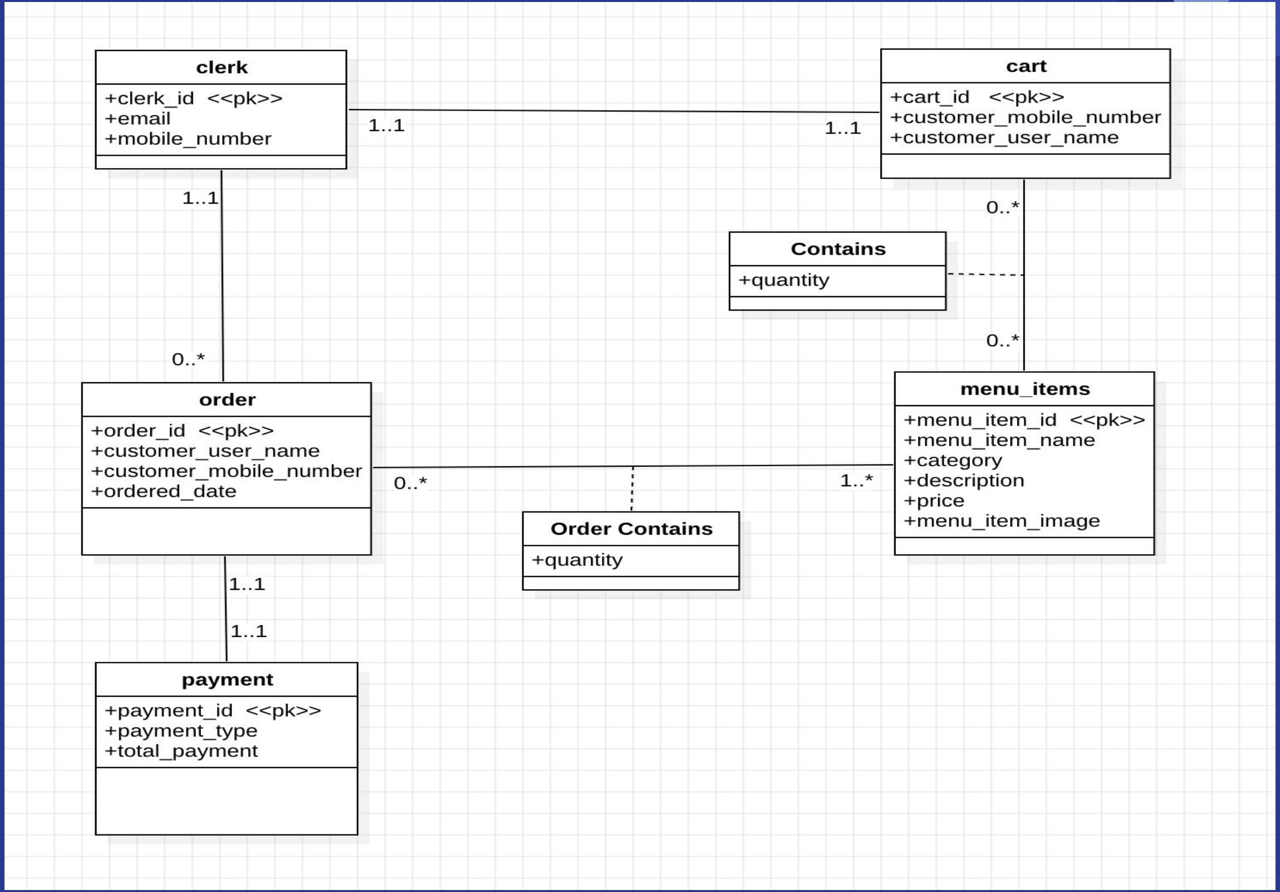
Cafe Management System

The cafe management system acts as a digital backbone of the cafe. Our cafe management system aims for efficient order management and menu management thereby positively impacting the business of the cafe.

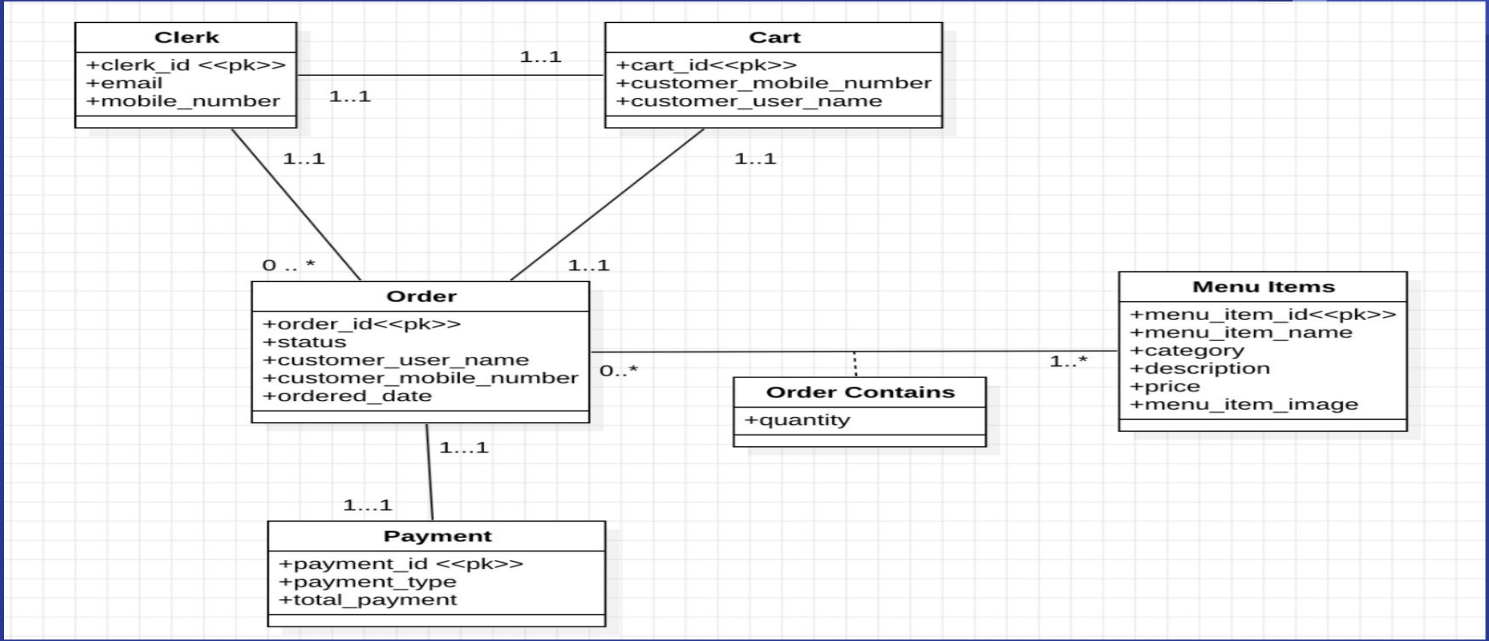
Database Schema

The proposed database will consist of seven tables. The clerk, order, payment, menu_items, order Contains, cart, contains tables store various fields with related data. This schema provides a structured framework for managing cafe operations, facilitating efficient data storage, retrieval, and analysis.

UML Diagram - 1

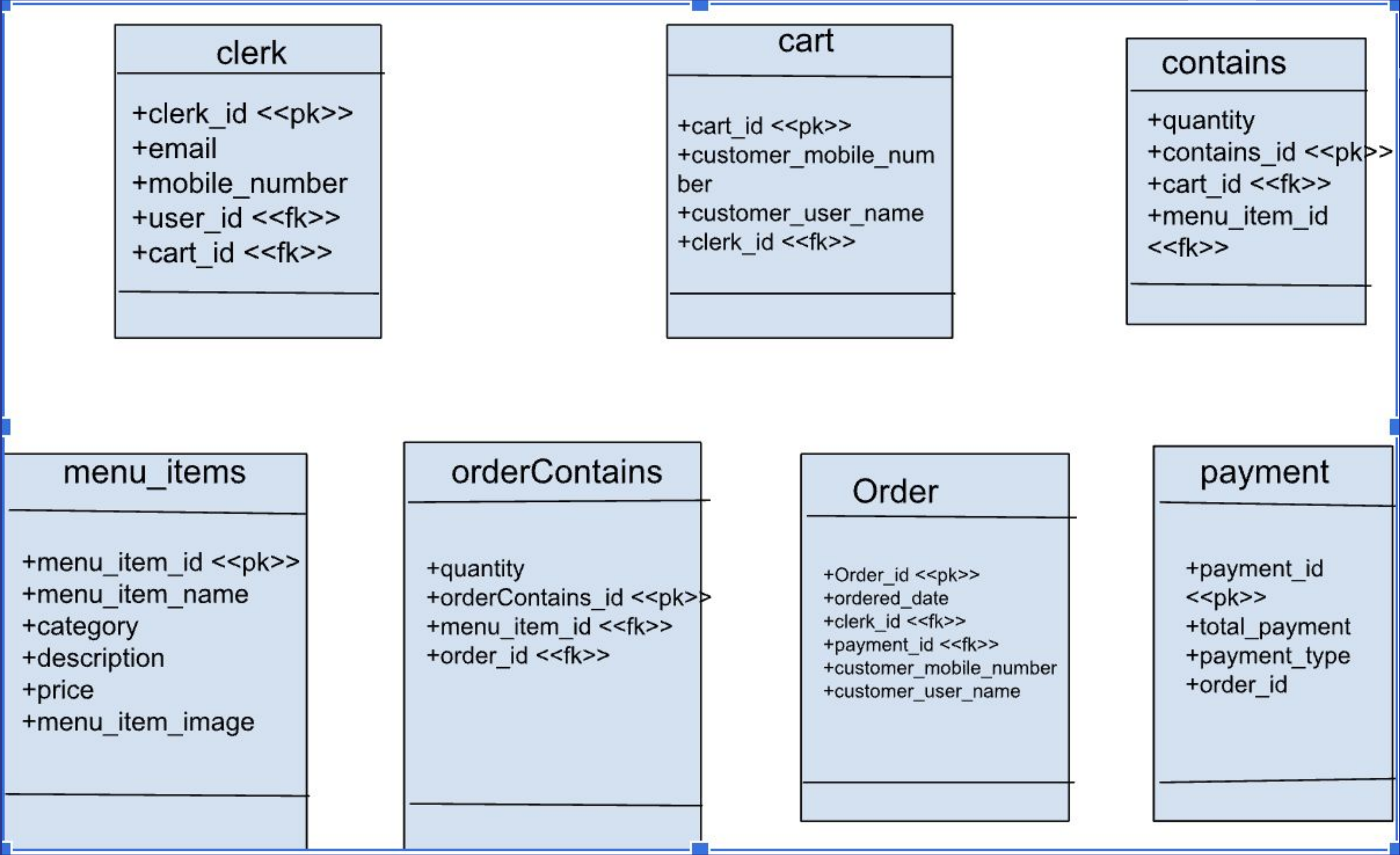


UML Diagram - 2



In UML Diagram-2, we added attribute status in Order table, but this design increased memory. So we decided to increase complexity to save memory and chosen the UML Diagram -1

Relational Model



Functional dependencies

- ❑ clerk_id → email, mobile_number, cart_id
- ❑ order_id → ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name
- ❑ cart_id → clerk_id, customer_mobile_number, customer_user_name
- ❑ menu_item_id → menu_item_name, category, description, price, menu_item_image
- ❑ payment_id → total_payment, payment_type, order_id
- ❑ menuitem_id, order_id → order_quantity
- ❑ menuitem_id, cart_id → cart_quantity

BCNF Decomposition

Clerk_id, email,mobile_number, cart_id, customer_mobile_number, customer_user_name, order_quantity, cart_quantity, menu_item_id, menu_item_name, category, description,. Price, menu_item_image, order_id, ordered_date, payment_id, total_payment, payment_type

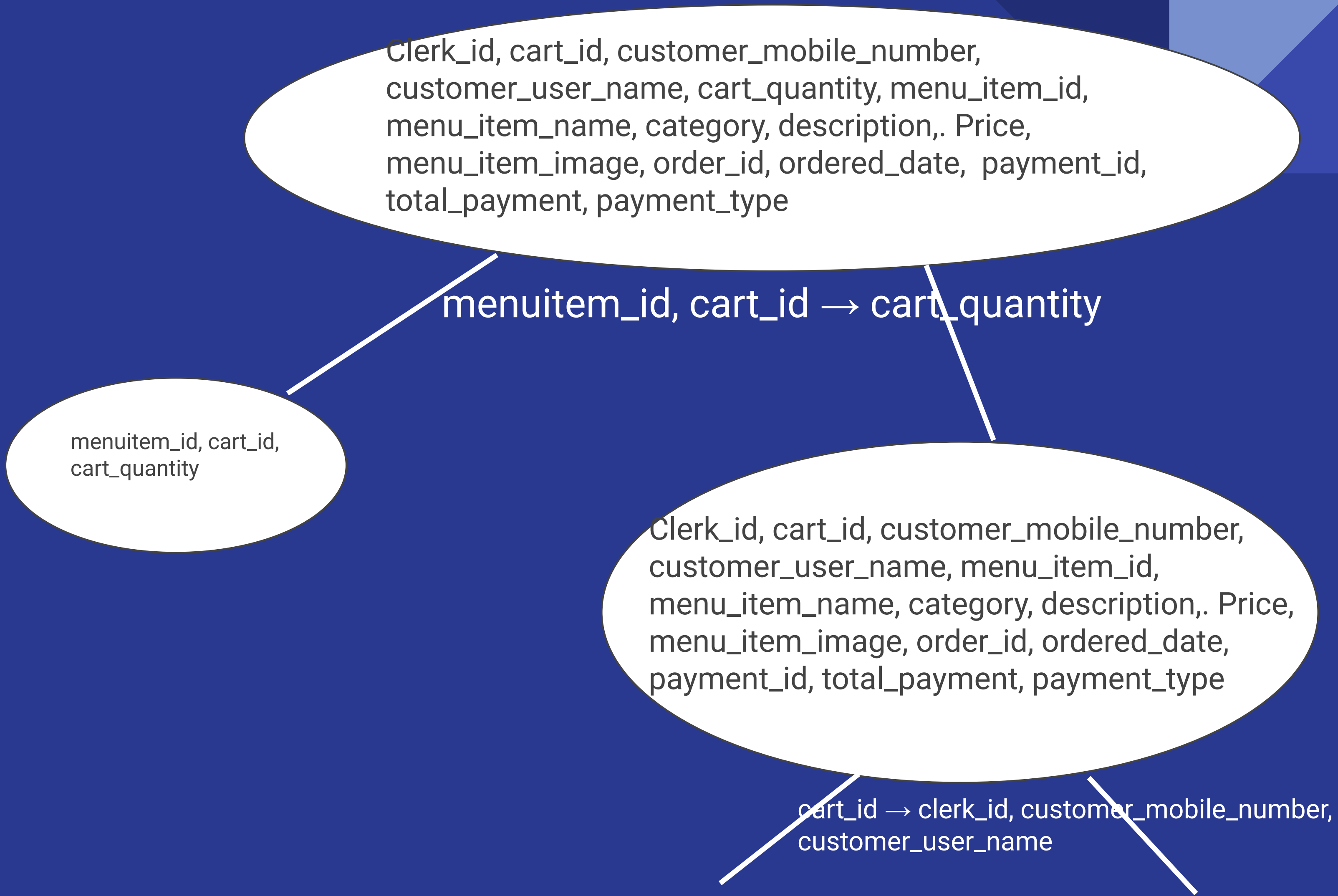
clerk_id → email,mobile_number

Clerk_id, email, mobile_number_id

Clerk_id, cart_id, customer_mobile_number, customer_user_name, order_quantity, cart_quantity, menu_item_id, menu_item_name, category, description,. Price, menu_item_image, order_id, ordered_date, payment_id, total_payment, payment_type

menuitem_id, order_id, order_quantity

menuitem_id, order_id → order_quantity



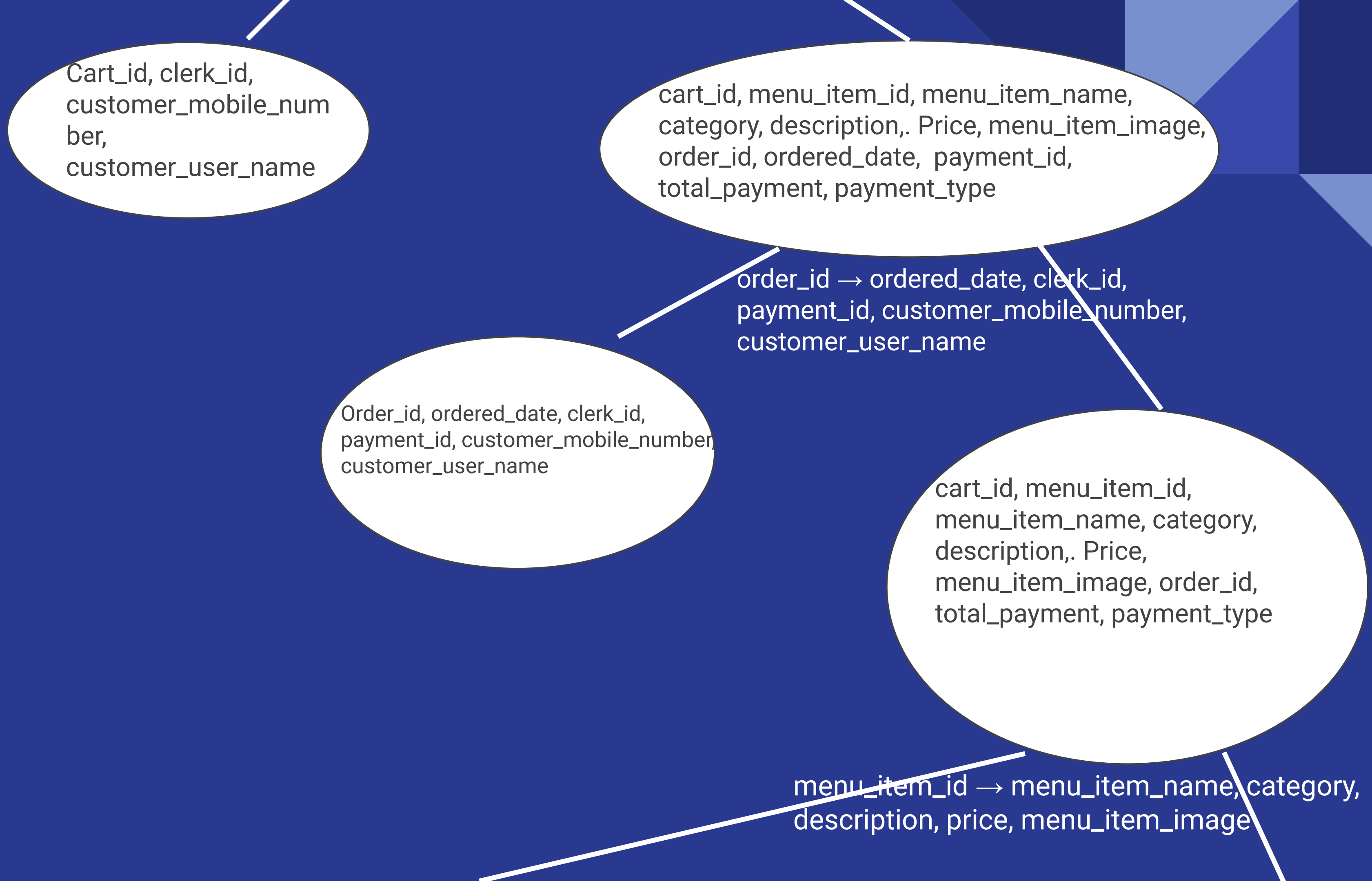
Clerk_id, cart_id, customer_mobile_number, customer_user_name, cart_quantity, menu_item_id, menu_item_name, category, description,. Price, menu_item_image, order_id, ordered_date, payment_id, total_payment, payment_type

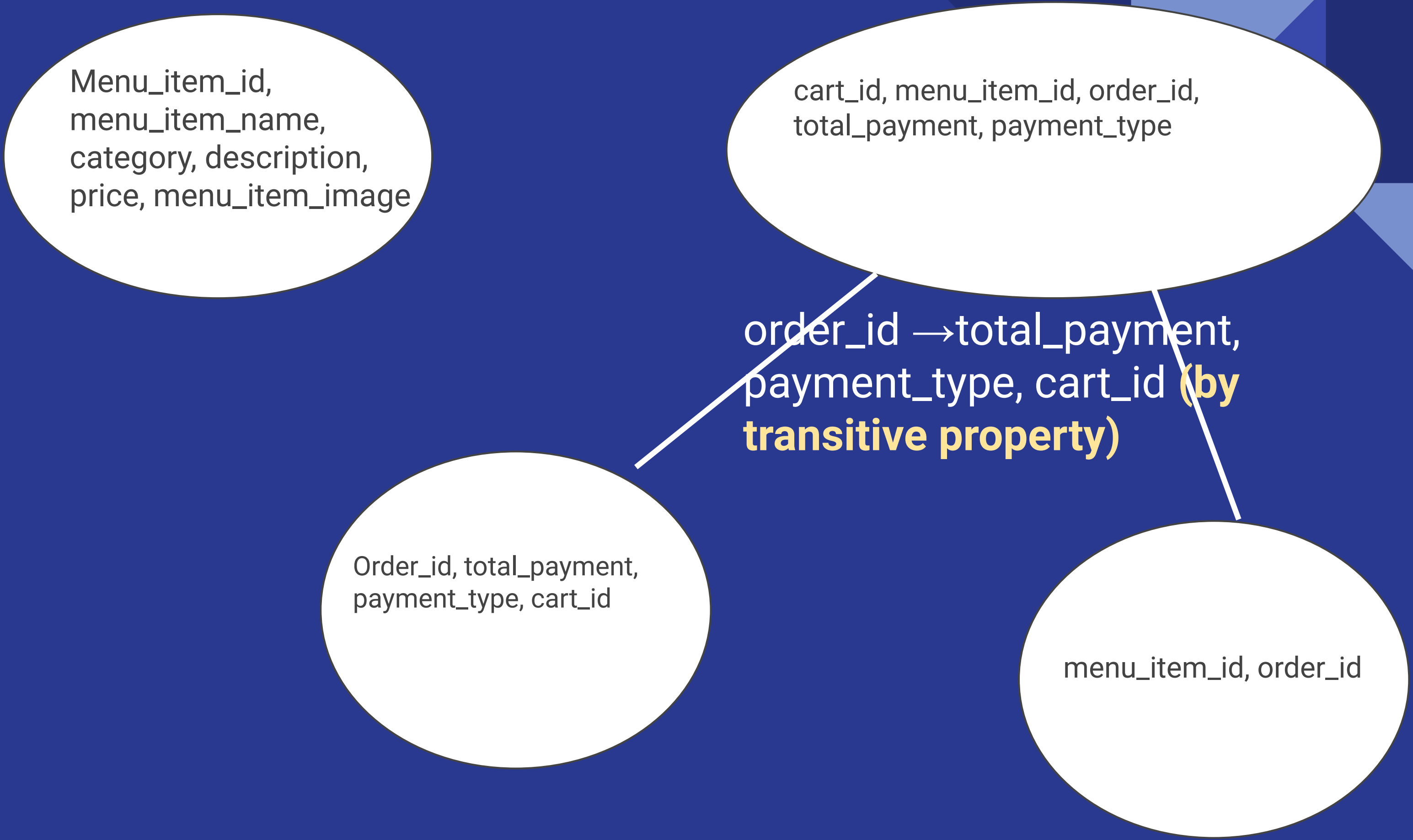
menuitem_id, cart_id → cart_quantity

menuitem_id, cart_id, cart_quantity

Clerk_id, cart_id, customer_mobile_number, customer_user_name, menu_item_id, menu_item_name, category, description,. Price, menu_item_image, order_id, ordered_date, payment_id, total_payment, payment_type

cart_id → clerk_id, customer_mobile_number, customer_user_name


Cart_id, clerk_id, customer_mobile_number, customer_user_name
cart_id, menu_item_id, menu_item_name, category, description,. Price, menu_item_image, order_id, ordered_date, payment_id, total_payment, payment_type
order_id → ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name
Order_id, ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name
cart_id, menu_item_id, menu_item_name, category, description,. Price, menu_item_image, order_id, total_payment, payment_type
menu_item_id → menu_item_name, category, description, price, menu_item_image


Menu_item_id, menu_item_name, category, description, price, menu_item_image
cart_id, menu_item_id, order_id, total_payment, payment_type
order_id →total_payment, payment_type, cart_id **(by transitive property)**
Order_id, total_payment, payment_type, cart_id
menu_item_id, order_id

Global key: menu_item_id, order_id

Schema 3: 3NF Synthesis algorithm

Step 1a: Singleton RHS Attributes

clerk_id → email
clerk_id → mobile_number
clerk_id → cart_id
order_id → ordered_date
order_id → clerk_id
order_id → payment_id
order_id → customer_mobile_number
order_id → customer_user_name
cart_id → clerk_id
cart_id → customer_mobile_number
cart_id → customer_user_name

menu_item_id → menu_item_name
menu_item_id → category
menu_item_id → description
menu_item_id → price
menu_item_id → menu_item_image
payment_id → total_payment
payment_id → payment_type
payment_id → order_id
menuitem_id, order_id → order_quantity
menuitem_id, cart_id → cart_quantity

Schema 3: 3NF Synthesis algorithm

Step 1(b) :- No extraneous attributes in LHS

Step 1(c):- No Redundant FD’s

Step 2:- Merge FD ’s with common LHS.

- ❏ clerk_id → email, mobile_number, cart_id
- ❏ order_id → ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name
- ❏ cart_id → clerk_id, customer_mobile_number, customer_user_name
- ❏ menuitem_id → menu_item_name, category, description, price, menu_item_image
- ❏ payment_id → total_payment, payment_type, order_id
- ❏ menuitem_id, order_id → order_quantity
- ❏ menuitem_id, cart_id → cart_quantity

Schema 3: 3NF Synthesis algorithm

Step 3:- For each FD form Resultant Tables

- ❑ clerk(clerk_id, email, mobile_number, cart_id)
- ❑ order(order_id, ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name)
- ❑ cart(cart_id, clerk_id, customer_mobile_number, customer_user_name)
- ❑ menuitem(menu_item_id, menu_item_name, category, description, price, menu_item_image)
- ❑ payment(payment_id, total_payment, payment_type, order_id)
- ❑ orderContains(menuitem_id, order_id, order_quantity)
- ❑ contains(menuitem_id, cart_id, cart_quantity)

Schema 3: 3NF Synthesis algorithm

Step 4:- Remove Subset Tables - No Subset Tables

Step 5:- Check for Losslessness

- order_id, menuitem_id are global keys

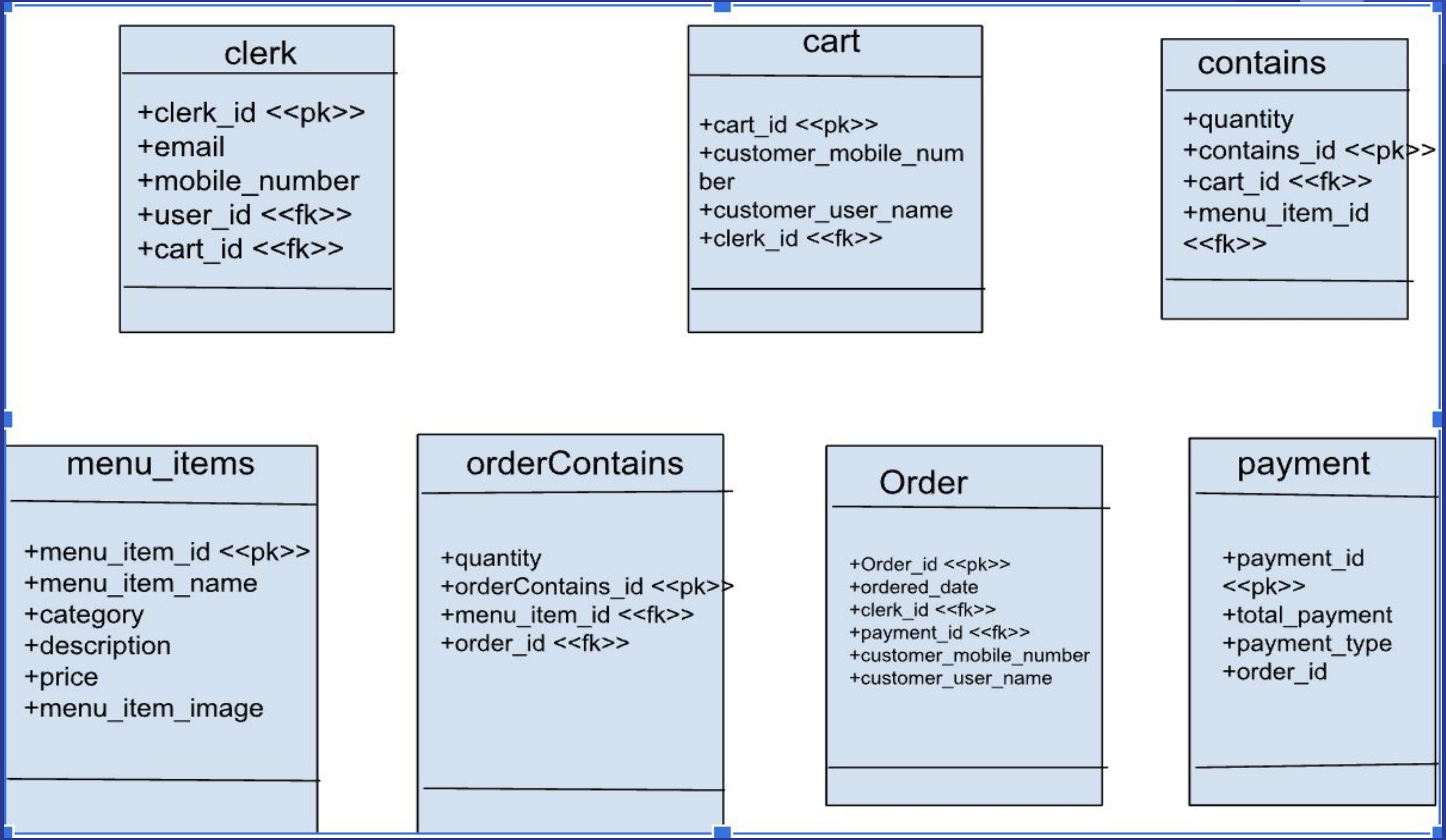
order_id, menuitem_id → cart_id, clerk_id, email, mobile_number, ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name, menu_item_name, category, description, price, menu_item_image, total_payment, payment_type, order_quantity, cart_quantity

Schema 3: 3NF Synthesis algorithm

Final tables for 3NF

- ❑ clerk(clerk_id, email, mobile_number, cart_id)
- ❑ order(order_id, ordered_date, clerk_id, payment_id, customer_mobile_number, customer_user_name)
- ❑ cart(cart_id, clerk_id, customer_mobile_number, customer_user_name)
- ❑ menuitem(menu_item_id, menu_item_name, category, description, price, menu_item_image)
- ❑ payment(payment_id, total_payment, payment_type, order_id)
- ❑ orderContains(menuitem_id, order_id, order_quantity)
- ❑ contains(menuitem_id, cart_id, cart_quantity)

Final Schema and Constraints



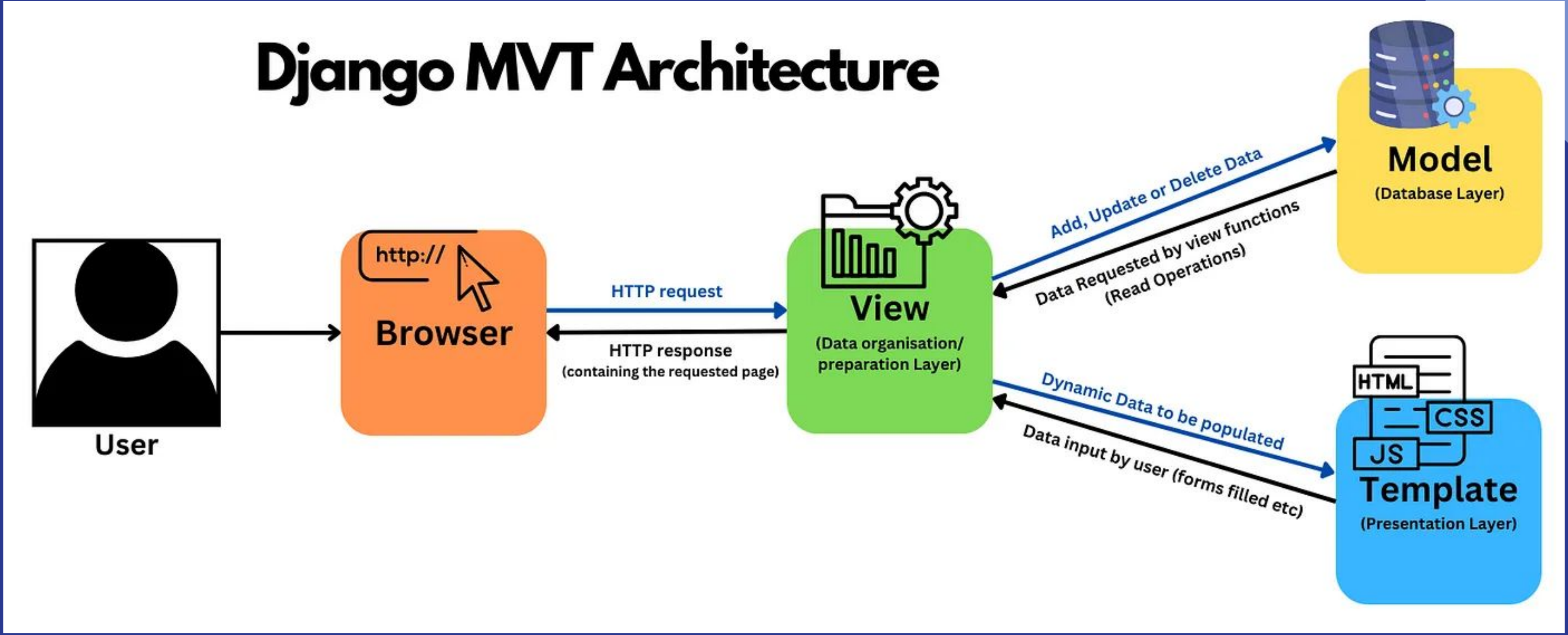
Comparison of Schemas

	UML	BCNF	3NF
Reduction in Redundancy	Good	Average	Good
Maintaining data integrity	Good	Good	Good
Preservation of information-Losslessness	Yes	Yes	Yes
Functional dependency preservation	Yes	No	Yes
Aggregate Performance	Good	Average	Good
Number of Tables	7	8	8

Software Used

- ❑ HTML
- ❑ CSS
- ❑ Django(Python)
- ❑ Javascript
- ❑ PostgreSQL

Software Architecture and Components

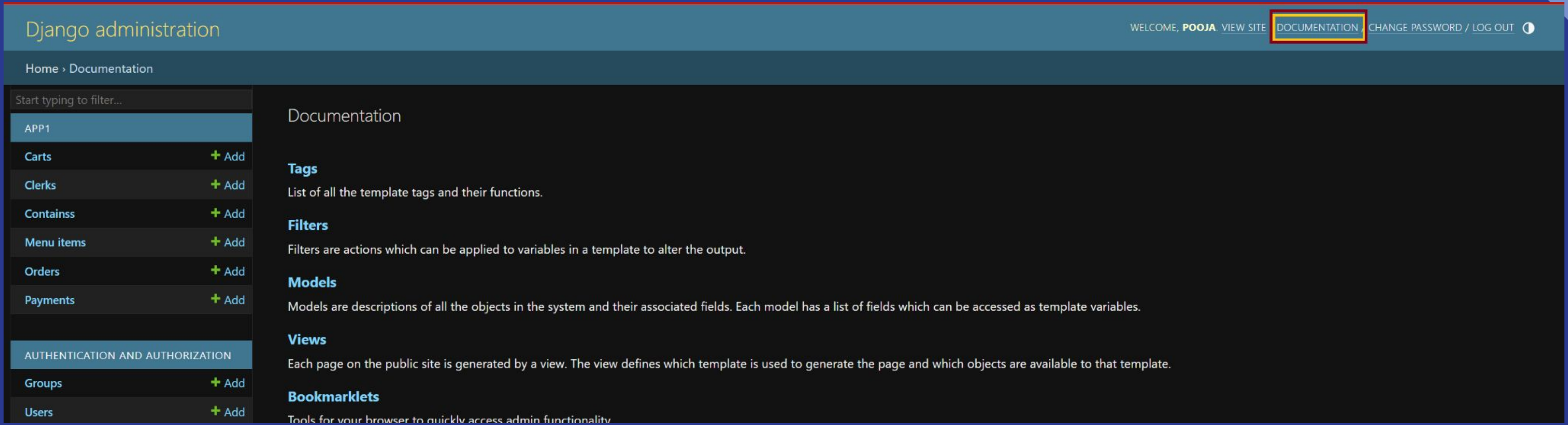

Django MVT Architecture
User
http://
Browser
HTTP request
HTTP response
(containing the requested page)
View
(Data organisation/ preparation Layer)
Add, Update or Delete Data
Data Requested by view functions
(Read Operations)
Model
(Database Layer)
Dynamic Data to be populated
Data input by user (forms filled etc)
HTML
CSS
JS
Template
(Presentation Layer)

How to run the code?

in settings.py changethese values to run the project

```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql',
        'NAME': 'Cafe',
        'USER': 'postgres',
        'PASSWORD': 'Sql@10071999',
        'HOST': 'localhost',   # Or your database host
        'PORT': '5432',        # Or your database port
    }
}
python manage.py makemigrations
python manage.py migrate
python manage.py runserver
```

Pydocs can be viewed in the admin page of application



Documentation

Tags

List of all the template tags and their functions.

Filters

Filters are actions which can be applied to variables in a template to alter the output.

Models

Models are descriptions of all the objects in the system and their associated fields. Each model has a list of fields which can be accessed as template variables.

Views

Each page on the public site is generated by a view. The view defines which template is used to generate the page and which objects are available to that template.

Bookmarklets

Tools for your browser to quickly access admin functionality

Thank You