

# Database Management (CSC 410)

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# **1. Introduction**

## **1.1. Statement of Problem**

Model and design a database for Taaskly Service (<https://taaskly.xyz>).

## **1.2. Organisation Overview**

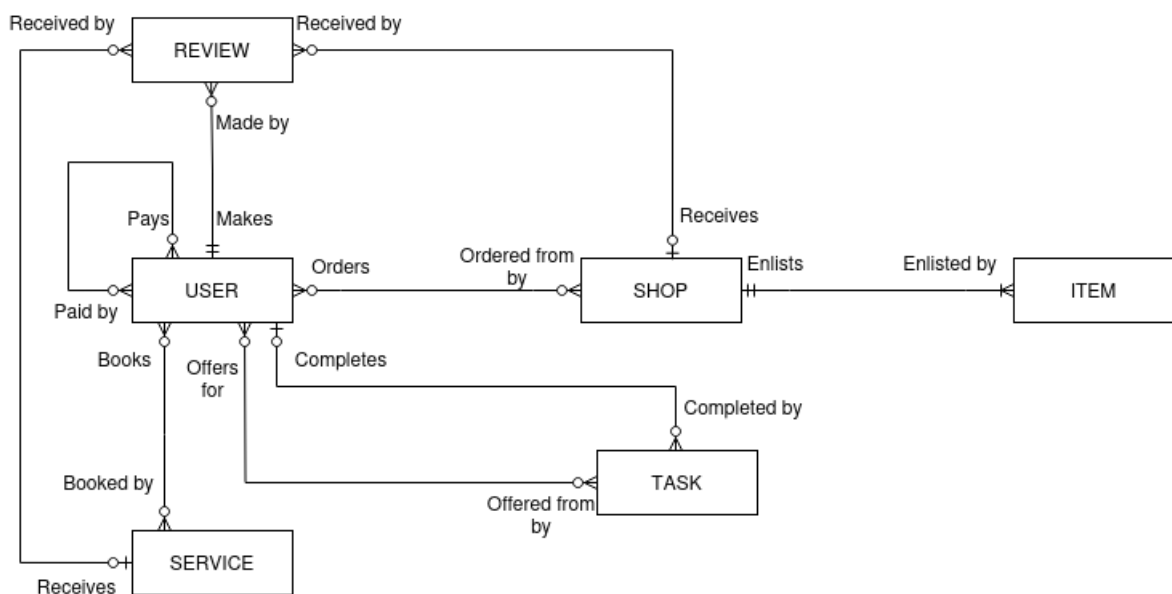
Taaskly is a platform that allows individuals to create listings for tasks they need to have done, as well as products and services they offer. Users who require assistance can post their tasks, while those who offer products and services can create a listing to increase their visibility. Customers can then browse the listings, read reviews, and use our secure payment feature to ensure that their funds are held safely until the business deal is completed. Users use the payment feature to pay for services or products offered through on Taaskly. Funds are held until the service is completed and released to the service provider only after the customer confirms the completion of the service.

## 2. Analysis

### 2.1. Entities

- USER: a customer on the Taaskly platform
- SHOP: a vendor selling products
- ITEM: a product enlisted by a vendor
- SERVICE: an activity rendered
- TASK: an activity to be undertaken
- REVIEW: a comment about an experience

### 2.2. Enterprise ER Diagram



### 2.3. Business Rules

- A USER may make many orders from many SHOPS. Each SHOP may be ordered from by many USERS.
- A USER may book many SERVICES. Each SERVICE may be booked by many USERS.
- A USER may complete many TASKs. Each TASK may be completed by a USER.
- A USER may offer to complete many TASKs. Each TASK may receive offers by many USERS.
- A USER may pay other USERS. Each USER may be paid by other USERS.
- A SHOP must enlist one or more ITEMS. Each ITEM must be enlisted by a SHOP.
- A USER may make many REVIEWs. Each REVIEW must be made by a USER.

- A SHOP may receive many REVIEWs. Each REVIEW may be received by a SHOP.
- A SERVICE may receive many REVIEWs. Each REVIEW may be received by a SERVICE.

## 2.4. Entity Modelling

### USER

Attributes	Data Type	Description	Example
<u>User_Id(PK)</u>	int	User's identifier	4112
User_Email	char(50)	User's email	p45@gmail.com
User_Nickname	char(25)	Username	user_p45
User_Firstname	char(25)	User's firstname	Blossom
User_Lastname	char(25)	User's lastname	Dmitri
User_Bio	varchar(1000) (optional)	User's biography	I am a genius, the myth and the legend.
User_Phone	char(13)	User's phone no.	08012345678
User_Balance	double	User's wallet balance	420.99
User_Referral_Code	char(6)	User's referral code	TSKP45
User_Profile_Picture	blob (optional)	User's profile picture	

### SHOP

Attributes	Data Type	Description	Example
<u>Shop_Id(PK)</u>	int	Shop's identifier	231
<u>User_Id(FK)</u>	int	Shop's owner	3143
Shop_Name	char(50)	Shop's name	The Yam That I Yam Stores
Shop_Profile_Picture	blob (optional)	Shop's profile picture	
Shop_Bio	varchar(1000)	Shop's description	We sell food items
Shop_Phone	char(13)	Shop's phone no.	08012345678
(Shop_Location)		(Street, City, State)	(Olise St, Yaba, Lagos)

### ITEM

Attributes	Data Type	Description	Example
<u>Item_Id(PK)</u>	int	Item identifier	419

<u>Shop_Id(FK)</u>	int	Item seller	321
Item_Name	char(50)	Item name	Azkaban Loud
Item_Description	char(1000)	Item description	Hogwarts premium enchanted cigarettes
Item_Price	double	Item price	4323.00
Item_Image	blob	Item picture	
{Item_Category}		Item category	{Food, Grocery}

## SERVICE

Attributes	Data Type	Description	Example
<u>Service_Id(PK)</u>	int	Service identifier	3219
<u>User_Id(FK)</u>	int	Service owner	321
Service_Name	char(50)	Service name	Otunba Wire Wire
Service_Bio	char(1000)	Service description	Electrical fittings and wiring
Service_Rating	double	Service rating	3.5
Service_Phone	char(13)	Service phone no.	08012345678
Service_Profile_Picture	blob	Service profile picture	
(Service_Location)		(Street, City, State)	(Olise St, Yaba, Lagos)
{Service_Category}		Service category	{Electronics, Electrical}

## TASK

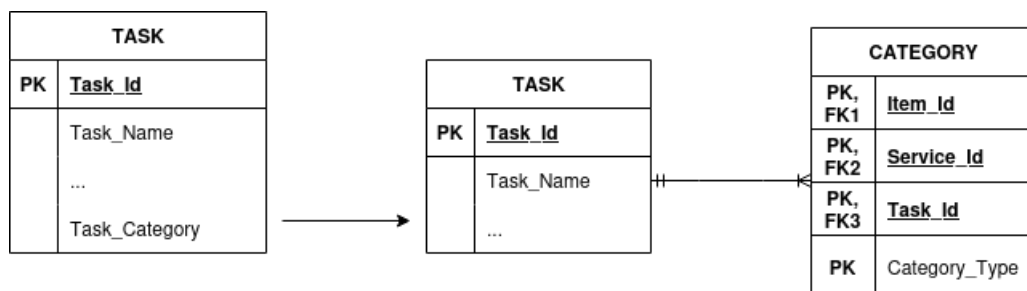
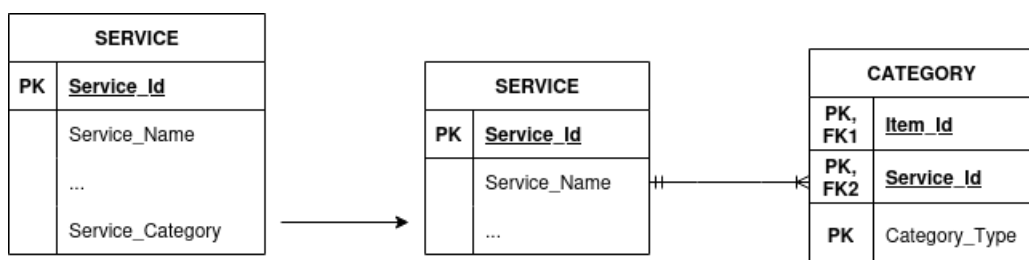
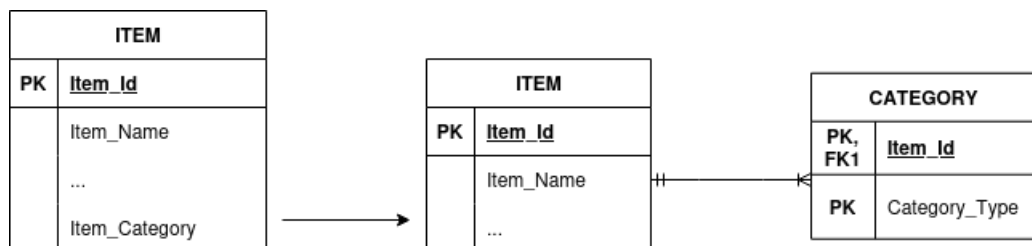
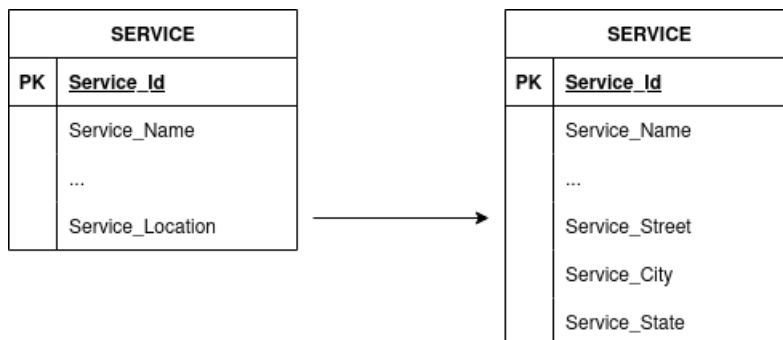
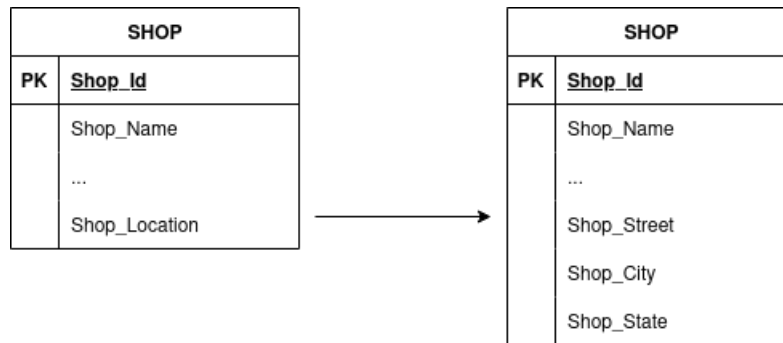
Attributes	Data Type	Description	Example
<u>Task_Id(PK)</u>	int	Task's identifier	8983
<u>User_Id(FK)</u>	int	Task's creator	6782
Task_Description	char(1000)	Task's description	I need a french language tutor
Task_Price	double	Amount to be paid	4257.99
Task_Status	char(10)	Task's status	Opened/Closed
<u>Task_Executor(FK)</u>	int	Task's executor	323
Task_Expiration_Date	datetime	Application deadline	23/03/2015 03:30:00
{Task_Category}		Task's category	{Linguistics, Teaching}
(Task_Offers)		(Description, Price)	(Je ne sais quois, va va voom!!, 50000.00)

## REVIEW

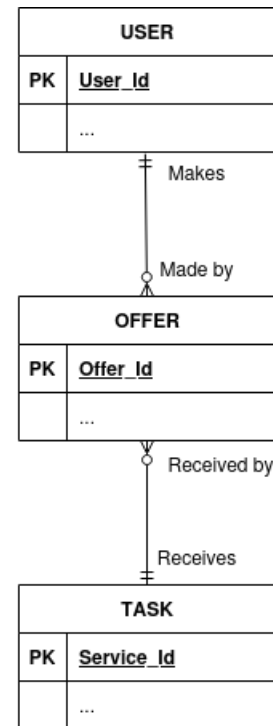
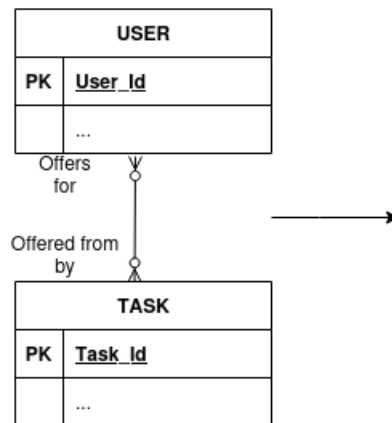
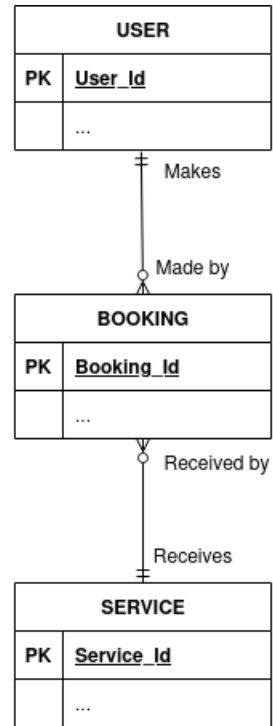
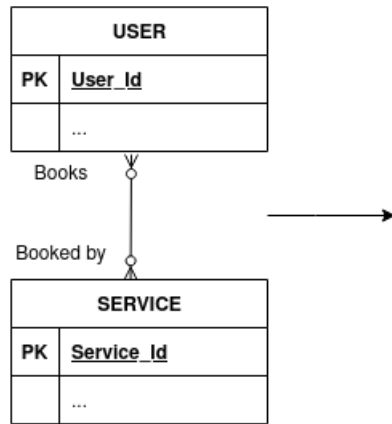
Attributes	Data Type	Description	Example
<u>Review_Id</u> (PK)	int	Review's identifier	8983
<u>User_Id</u> (FK)	int	Review creator	6782
Review_Comment	char(1000)	Review left by user	Very very poor. Caused an electrical fire in my home
Review_Rating	double	User rating	3.5
Review_Timestamp	datetime	Review date and time	23/04/2033 09:33:02AM
<u>Shop_Id</u> (FK)	int	Shop's identifier	6533
<u>Service_Id</u> (FK)	int	Service identifier	345544

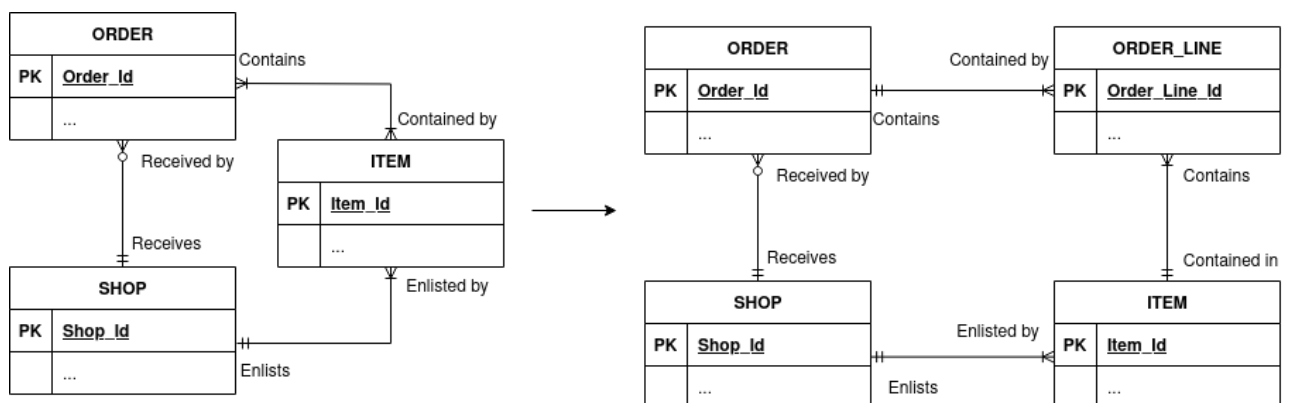
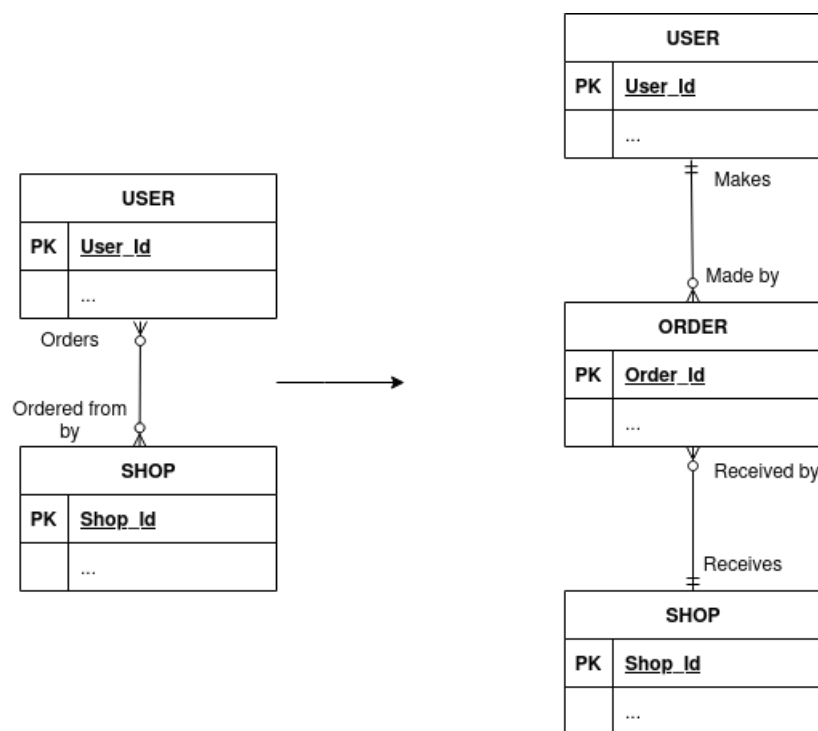
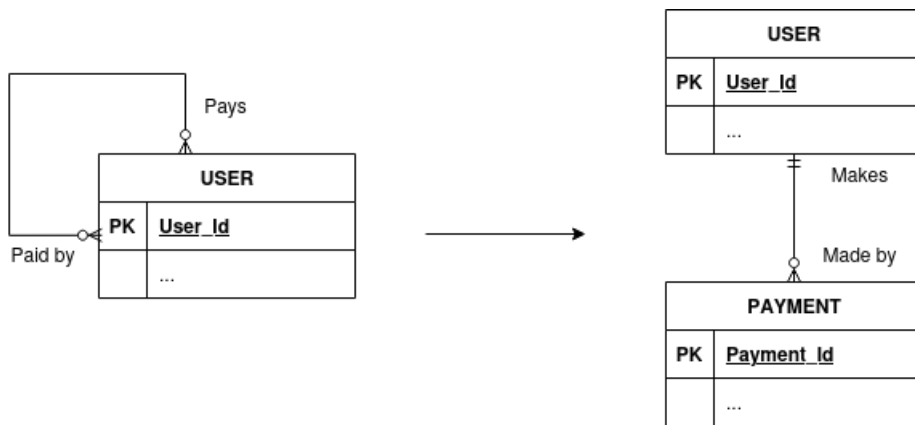
### 3. Design

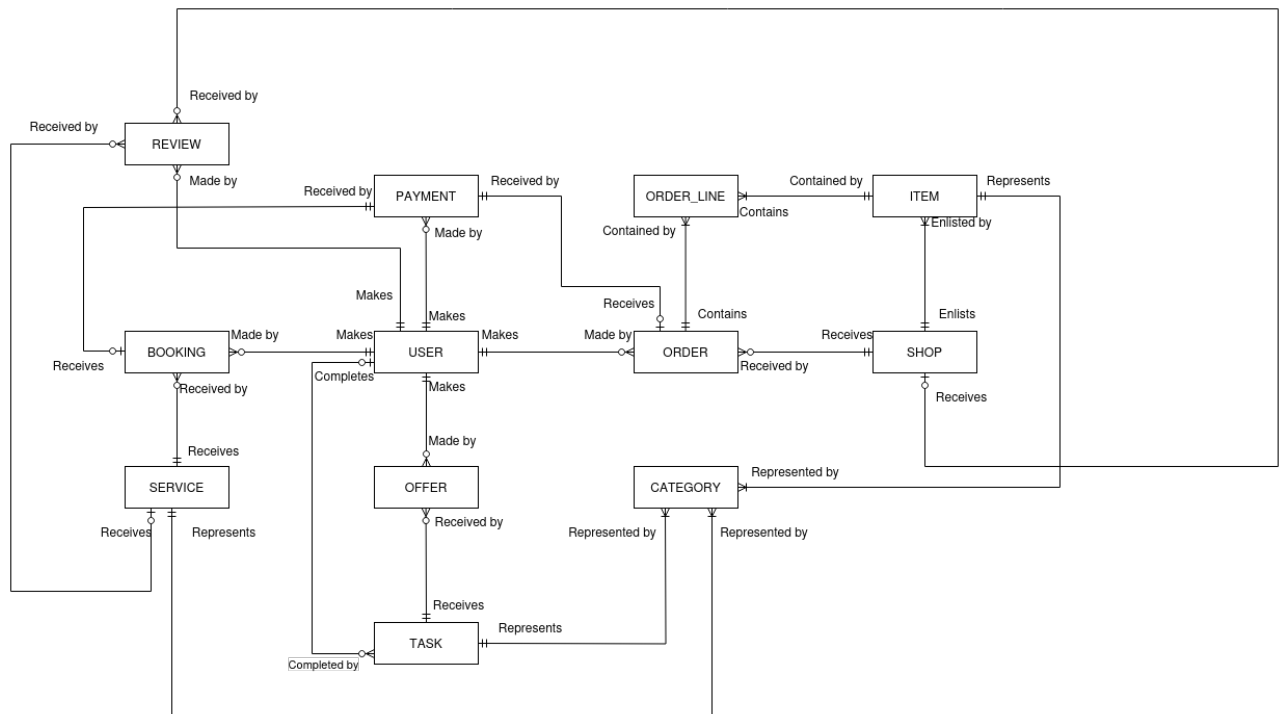
#### 3.1. Mapping ER Diagram to Relations











## USER

Attributes	Data Type	Description	Example
<u>User_Id(PK)</u>	int	User's identifier	4112
User_Email	char(50)	User's email	p45@gmail.com
User_Nickname	char(25)	Username	user_p45
User_Firstname	char(25)	User's firstname	Blossom
User_Lastname	char(25)	User's lastname	Dmitri
User_Bio	varchar(1000) (optional)	User's biography	I am a genius, the myth and the legend.
User_Phone	char(13)	User's phone no.	08012345678
User_Balance	double	User's wallet balance	420.99
User_Referral_Code	char(6)	User's referral code	TSKP45
User_Profile_Picture	blob (optional)	User's profile picture	

## SHOP

Attributes	Data Type	Description	Example
<u>Shop_Id(PK)</u>	int	Shop's identifier	231
Shop_Name	char(50)	Shop's name	The Yam That I Yam Stores
Shop_Profile_Pictur	blob	Shop's profile	

e	(optional)	picture	
Shop_Bio	varchar(1000)	Shop's description	We sell food items
Shop_Phone	char(13)	Shop's phone no.	08012345678
Shop_Street	char(25)	Shop's street	Olise St
Shop_City	char(25)	Shop's city	Yaba
Shop_State	char(25)	Shop's state	Lagos

## ITEM

Attributes	Data Type	Description	Example
<u>Item_Id(PK)</u>	int	Item identifier	419
<u>Shop_Id(FK)</u>	int	Item seller	321
Item_Name	char(50)	Item name	Azkaban Loud
Item_Description	char(1000)	Item description	Hogwarts premium enchanted cigarettes
Item_Price	double	Item price	4323.00
Item_Image	blob	Item picture	

## ORDER

Attributes	Data Type	Description	Example
<u>Order_Id(PK)</u>	int	Order identifier	419
<u>Shop_Id(FK)</u>	int	Vendor's identifier	321
<u>User_Id(FK)</u>	int	Identifier of user making order	3
Order_Cost	double	Order's cost	4232.00

## ORDER\_LINE

Attributes	Data Type	Description	Example
<u>Order_Line_Id(PK)</u>	int	Order line's identifier	419
<u>Order_Id(FK)</u>	int	Order's identifier	321
<u>Item_Id(FK)</u>	int	Item's identifier	430
Order_Line_Item_Quantity	int	Item's quantity	2
Order_Line_Cost	double	Order line's cost	333.85

## SERVICE

Attributes	Data Type	Description	Example
<u>Service_Id(PK)</u>	int	Service identifier	3219
Service_Name	char(50)	Service name	Otunba Wire Wire
Service_Bio	varchar(1000) )	Service description	Electrical fittings and wiring
Service_Phone	char(13)	Service phone no.	08012345678
Service_Profile_Picture	blob	Service profile picture	
Service_Street	char(25)	Service street	Olise St
Service_City	char(25)	Service city	Yaba
Service_State	char(25)	Service state	Lagos

## BOOKING

Attributes	Data Type	Description	Example
<u>Booking_Id(PK)</u>	int	Booking's identifier	3219
<u>Service_Id(FK)</u>	int	Service identifier	321
<u>User_Id(FK)</u>	Int	Service client	432
Booking_Date	datetime	Booking's date	31/03/2021 09:30:00AM

## TASK

Attributes	Data Type	Description	Example
<u>Task_Id(PK)</u>	int	Task's identifier	8983
Task_Description	varchar(1000)	Task's description	I need a french language tutor
Task_Price	double	Amount to be paid	4257.99
Task_Status	char(10)	Task's status	Opened/Closed
Task_Expiration_Date	datetime	Application deadline	23/03/2015 03:30:00AM

## OFFER

Attributes	Data Type	Description	Example
<u>Offer_Id(PK)</u>	int	Offer's identifier	8983
<u>Task_Id(FK)</u>	int	Task's identifier	6782
<u>User_Id(FK)</u>	int	User making an offer	3
Offer_Description	varchar(1000)	Offer's description	Je ne sais quois, va va voom!!

Offer_Price	double	Asking price	50000.00
Offer_Status	char(10)	Task's status	Accepted/Pending/ Rejected
Offer_Timestamp	datetime	Offer's timestamp	23/03/2015 03:30:00AM

## REVIEW

Attributes	Data Type	Description	Example
<u>Review_Id(PK)</u>	int	Review's identifier	8983
<u>User_Id(FK)</u>	int	Reviewer's identifier	6782
<u>Shop_Id(FK)</u>	int(optional)	Shop being reviewed	3
<u>Service_Id(FK)</u>	int(optional)	Service being reviewed	43
Review_Comment	varchar(1000)	Reviewer's comment	Very very poor. Caused an electrical fire in my home
Review_Rating	double	Reviewer's rating	3.5
Review_Timestamp	datetime	Review's timestamp	23/03/2015 03:30:00AM

## PAYMENT

Attributes	Data Type	Description	Example
<u>Payment_Id(PK)</u>	int	Payment's identifier	8983
<u>User_Id(FK)</u>	int	User making payment's identifier	6782
<u>Order_Id(FK)</u>	int(optional)	Order's identifier	3
<u>Booking_Id(FK)</u>	int(optional)	Booking's identifier	43
Payment_Amount	double	Amount paid	-3293.00
Payment_Reference	char(25)	Payment reference	TGNX27392209ZG
Payment_Type	char(25)	Payment type	Deposit/Withdrawal/ Shop/Service
Payment_Timestamp	datetime	Payment's timestamp	23/03/2015 03:30:00AM

## CATEGORY

Attributes	Data Type	Description	Example
Category_Type	char(25)	Category type	Electronics
<u>Task_Id</u> (FK)	int(optional)	Task's being categorised	6782
<u>Item_Id</u> (FK)	int(optional)	Item being categorised	3
<u>Service_Id</u> (FK)	int(optional)	Service being categorised	43

## 4. Implementation

### 4.1. SQL Code

```
CREATE TABLE `Taaskly`.`USER` (  
  `User_Id` INT NOT NULL,  
  `User_Email` CHAR(50) NOT NULL,  
  `User_Nickname` CHAR(25) NOT NULL,  
  `User_Firstname` CHAR(25) NOT NULL,  
  `User_Lastname` CHAR(25) NOT NULL,  
  `User_Bio` VARCHAR(1000) NULL,  
  `User_Phone` CHAR(13) NOT NULL,  
  `User_Balance` DOUBLE NOT NULL,  
  `User_Referral_Code` CHAR(6) NOT NULL,  
  `User_Profile_Picture` BLOB NULL,  
  PRIMARY KEY (`User_Id`));
```

```
CREATE TABLE `Taaskly`.`SHOP` (  
  `Shop_Id` INT NOT NULL,  
  `Shop_Name` CHAR(50) NOT NULL,  
  `Shop_Profile_Picture` BLOB NOT NULL,  
  `Shop_Bio` VARCHAR(1000) NOT NULL,  
  `Shop_Phone` CHAR(13) NOT NULL,  
  `Shop_Street` CHAR(25) NOT NULL,  
  `Shop_City` CHAR(25) NOT NULL,  
  `Shop_State` CHAR(25) NOT NULL,  
  PRIMARY KEY (`Shop_Id`));
```

```
CREATE TABLE `Taaskly`.`ITEM` (  
  `Item_Id` INT NOT NULL,  
  `Shop_Id` INT NOT NULL,  
  `Item_Name` CHAR(50) NOT NULL,  
  `Item_Description` VARCHAR(1000) NOT NULL,  
  `Item_Price` DOUBLE NOT NULL,  
  `Item_Image` BLOB NOT NULL,  
  PRIMARY KEY (`Item_Id`),  
  INDEX `fk_ITEM_1_idx` (`Shop_Id` ASC) VISIBLE,  
  CONSTRAINT `fk_ITEM_1`  
    FOREIGN KEY (`Shop_Id`)  
    REFERENCES `Taaskly`.`SHOP` (`Shop_Id`)  
    ON DELETE NO ACTION  
    ON UPDATE NO ACTION);
```

```
CREATE TABLE `Taaskly`.`SERVICE` (  
  `Service_Id` INT NOT NULL,  
  `Service_Name` CHAR(25) NOT NULL,
```



```

`Service_Bio` VARCHAR(1000) NOT NULL,
`Service_Phone` CHAR(13) NOT NULL,
`Service_Profile_Picture` BLOB NOT NULL,
`Service_Street` CHAR(25) NOT NULL,
`Service_City` CHAR(25) NOT NULL,
`Service_State` CHAR(25) NOT NULL,
PRIMARY KEY (`Service_Id`));

```

```

CREATE TABLE `Taaskly`.`TASK` (
  `Task_Id` INT NOT NULL,
  `Task_Description` VARCHAR(1000) NOT NULL,
  `Task_Price` DOUBLE NOT NULL,
  `Task_Status` VARCHAR(45) NOT NULL,
  `Task_Expiration_Date` VARCHAR(45) NOT NULL,
  PRIMARY KEY (`Task_Id`));

```

```

CREATE TABLE `Taaskly`.`REVIEW` (
  `Review_Id` INT NOT NULL,
  `User_Id` INT NOT NULL,
  `Shop_Id` INT NULL,
  `Service_Id` INT NULL,
  `Review_Comment` VARCHAR(1000) NOT NULL,
  `Review_Rating` DOUBLE NOT NULL,
  `Review_Timestamp` DATETIME NOT NULL,
  PRIMARY KEY (`Review_Id`),
  INDEX `fk_REVIEW_1_idx` (`User_Id` ASC) VISIBLE,
  INDEX `fk_REVIEW_2_idx` (`Shop_Id` ASC) VISIBLE,
  INDEX `fk_REVIEW_3_idx` (`Service_Id` ASC) VISIBLE,
  CONSTRAINT `fk_REVIEW_1`
    FOREIGN KEY (`User_Id`)
      REFERENCES `Taaskly`.`USER` (`User_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION,
  CONSTRAINT `fk_REVIEW_2`
    FOREIGN KEY (`Shop_Id`)
      REFERENCES `Taaskly`.`SHOP` (`Shop_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION,
  CONSTRAINT `fk_REVIEW_3`
    FOREIGN KEY (`Service_Id`)
      REFERENCES `Taaskly`.`SERVICE` (`Service_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION);

```

```

CREATE TABLE `Taaskly`.`CATEGORY` (
  `Category_Type` CHAR(25) NOT NULL,
  `Task_Id` INT NULL,
  `Item_Id` INT NULL,
  `Service_Id` INT NULL,
  INDEX `fk_CATEGORY_1_idx` (`Task_Id` ASC) VISIBLE,
  INDEX `fk_CATEGORY_2_idx` (`Item_Id` ASC) VISIBLE,
  INDEX `fk_CATEGORY_3_idx` (`Service_Id` ASC) VISIBLE,
  CONSTRAINT `fk_CATEGORY_1`
    FOREIGN KEY (`Task_Id`)
      REFERENCES `Taaskly`.`TASK` (`Task_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION,
  CONSTRAINT `fk_CATEGORY_2`
    FOREIGN KEY (`Item_Id`)
      REFERENCES `Taaskly`.`ITEM` (`Item_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION,
  CONSTRAINT `fk_CATEGORY_3`
    FOREIGN KEY (`Service_Id`)
      REFERENCES `Taaskly`.`SERVICE` (`Service_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION);

```

```

CREATE TABLE `Taaskly`.`OFFER` (
  `Offer_Id` INT NOT NULL,
  `Task_Id` INT NOT NULL,
  `User_Id` INT NOT NULL,
  `Offer_Description` VARCHAR(1000) NOT NULL,
  `Offer_Price` DOUBLE NOT NULL,
  `Offer_Status` CHAR(10) NOT NULL,
  `Offer_Timestamp` DATETIME NOT NULL,
  PRIMARY KEY (`Offer_Id`),
  INDEX `fk_OFFER_1_idx` (`User_Id` ASC) VISIBLE,
  INDEX `fk_OFFER_2_idx` (`Task_Id` ASC) VISIBLE,
  CONSTRAINT `fk_OFFER_1`
    FOREIGN KEY (`User_Id`)
      REFERENCES `Taaskly`.`USER` (`User_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION,
  CONSTRAINT `fk_OFFER_2`
    FOREIGN KEY (`Task_Id`)
      REFERENCES `Taaskly`.`TASK` (`Task_Id`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION);

```

```

CREATE TABLE `Taaskly`.`BOOKING` (
  `Booking_Id` INT NOT NULL,
  `Service_Id` INT NOT NULL,
  `User_Id` INT NOT NULL,
  `Booking_Date` DATETIME NOT NULL,
  PRIMARY KEY (`Booking_Id`),
  INDEX `fk_BOOKING_1_idx` (`Service_Id` ASC) VISIBLE,
  INDEX `fk_BOOKING_2_idx` (`User_Id` ASC) VISIBLE,
  CONSTRAINT `fk_BOOKING_1`
    FOREIGN KEY (`Service_Id`)
      REFERENCES `Taaskly`.`SERVICE` (`Service_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
  CONSTRAINT `fk_BOOKING_2`
    FOREIGN KEY (`User_Id`)
      REFERENCES `Taaskly`.`USER` (`User_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION);

```

```

CREATE TABLE `Taaskly`.`ORDER` (
  `Order_Id` INT NOT NULL,
  `Shop_Id` INT NOT NULL,
  `User_Id` INT NOT NULL,
  `Order_Cost` DOUBLE NOT NULL,
  PRIMARY KEY (`Order_Id`),
  INDEX `fk_ORDER_1_idx` (`Shop_Id` ASC) VISIBLE,
  INDEX `fk_ORDER_2_idx` (`User_Id` ASC) VISIBLE,
  CONSTRAINT `fk_ORDER_1`
    FOREIGN KEY (`Shop_Id`)
      REFERENCES `Taaskly`.`SHOP` (`Shop_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
  CONSTRAINT `fk_ORDER_2`
    FOREIGN KEY (`User_Id`)
      REFERENCES `Taaskly`.`USER` (`User_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION);

```

```

CREATE TABLE `Taaskly`.`ORDER_LINE` (
  `Order_Line_Id` INT NOT NULL,
  `Order_Id` INT NOT NULL,
  `Item_Id` INT NOT NULL,
  `Order_Line_Item_Quantity` INT NOT NULL,
  `Order_Line_Cost` DOUBLE NOT NULL,
  PRIMARY KEY (`Order_Line_Id`),

```

```

INDEX `fk_ORDER_LINE_1_idx` (`Order_Id` ASC) VISIBLE,
INDEX `fk_ORDER_LINE_2_idx` (`Item_Id` ASC) VISIBLE,
CONSTRAINT `fk_ORDER_LINE_1`
    FOREIGN KEY (`Order_Id`)
    REFERENCES `Taaskly`.`ORDER` (`Order_Id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
CONSTRAINT `fk_ORDER_LINE_2`
    FOREIGN KEY (`Item_Id`)
    REFERENCES `Taaskly`.`ITEM` (`Item_Id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION);

```

```

CREATE TABLE `Taaskly`.`PAYMENT` (
    `Payment_Id` INT NOT NULL,
    `User_Id` INT NOT NULL,
    `Order_Id` INT NULL,
    `Booking_Id` INT NULL,
    `Payment_Amount` DOUBLE NOT NULL,
    `Payment_Reference` CHAR(25) NOT NULL,
    `Payment_Type` CHAR(25) NOT NULL,
    `Payment_Timestamp` DATETIME NOT NULL,
    PRIMARY KEY (`Payment_Id`),
    INDEX `fk_PAYMENT_1_idx` (`User_Id` ASC) VISIBLE,
    INDEX `fk_PAYMENT_2_idx` (`Order_Id` ASC) VISIBLE,
    INDEX `fk_PAYMENT_3_idx` (`Booking_Id` ASC) VISIBLE,
    CONSTRAINT `fk_PAYMENT_1`
        FOREIGN KEY (`User_Id`)
        REFERENCES `Taaskly`.`USER` (`User_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
    CONSTRAINT `fk_PAYMENT_2`
        FOREIGN KEY (`Order_Id`)
        REFERENCES `Taaskly`.`ORDER` (`Order_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
    CONSTRAINT `fk_PAYMENT_3`
        FOREIGN KEY (`Booking_Id`)
        REFERENCES `Taaskly`.`BOOKING` (`Booking_Id`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION);

```