Pedal – Cycling Unit

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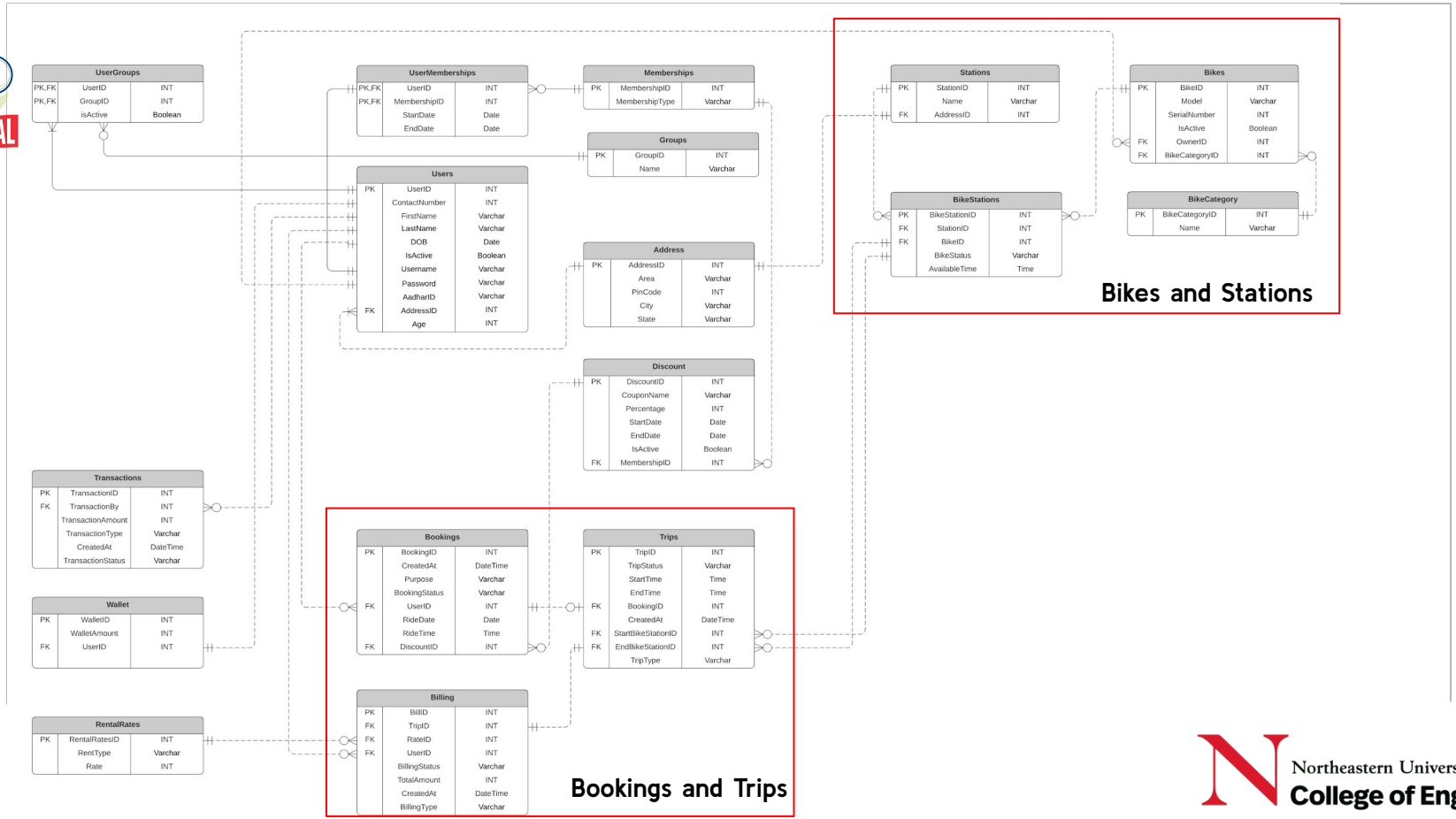
Why Pedal ?

Key Objectives

Business Problems Addressed

- Centralized cycling system
- Eco-friendly way of transportation
- Bicycle owners can contribute
- Cost efficient
- Avail benefits of various discounts offered

ERD



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Stored Procedures

SP for Start Trip

```
CREATE PROCEDURE dbo.StartTrip
@BookingID INT, @StationID INT, @BikeID INT,
@TripType Varchar(10), @StartBikeStationID INT;
AS
 BEGIN
  DECLARE @BikeStatus Varchar(30);
  IF(SELECT BikeStatus FROM BikeStations
     WHERE StationID=@StationID AND BikeID=@BikeID)='Available'
   BEGIN
    SELECT @StartBikeStationID = BikeStationID FROM BikeStations
    WHERE StationID = @StationID AND BikeID = @BikeID
    INSERT INTO Trips(BookingID, StartBikeStationID, TripType)
    VALUES (@BookingID, @StartBikeStationID, @TripType);
    BEGIN
     IF (@TripType = 'By User') SET @BikeStatus = 'Not Available';
     ELSE IF (@TripType = 'By Owner') SET @BikeStatus = 'Available'
    UPDATE [dbo].[BikeStations]
    SET BikeStatus = @BikeStatus, AvailableTime = CURRENT_TIMESTAMP
    WHERE BikeStationID = @StartBikeStationID
    END
   END
  ELSE
    PRINT('Bike At This Station Is not Available')
  END
```

SP for End Trip

```
CREATE PROCEDURE dbo.EndTrip
 @TripID Int, @StationID Int AS
  BEGIN
  DECLARE @BikeStatus VARCHAR(30),@TripType Varchar(20),@BikeID INT;
  SELECT @BikeID = BikeID,@TripType=TripType FROM Trips t JOIN BikeStations s
  ON t.StartBikeStationID = s.BikeStationID Where TripID = @TripID
  IF Exists(SELECT StationID,BikeID FROM BikeStations s
  WHERE (s.BikeID = @BikeID AND s.StationID = @StationID))
   BEGIN
    IF (@TripType = 'By User') SET @BikeStatus ='Available'
    ELSE IF(@TripType = 'By Owner') SET @BikeStatus = 'Not Available'
    UPDATE [dbo].[BikeStations]
    SET BikeStatus = @BikeStatus, AvailableTime = CURRENT_TIMESTAMP
    WHERE StationID = @StationID AND BikeID = @BikeID
   END
   ELSE
   BEGIN
    IF (@TripType = 'By User') SET @BikeStatus ='Available'
    ELSE IF(@TripType = 'By Owner') SET @BikeStatus = 'Not Available'
    INSERT INTO BikeStations(BikeID,StationID,BikeStatus,AvailableTime)
    Values(@BikeID,@StationID,@BikeStatus,CURRENT_TIMESTAMP)
   END
  UPDATE [dbo].[Trips]
  SET TripStatus = 'Completed', EndDateTime = CURRENT_TIMESTAMP,
  EndBikeStationID = (SELECT BikeStationID FROM BikeStations
  WHERE StationID = @StationID AND BikeID = @BikeID)
  WHERE TripID = @TripID;
 END
```

Stored Procedures


```
CREATE PROCEDURE [dbo].[AddBilling]     # SP to determine Time and Rate for Billing
 @TripID INT AS
 BEGIN
  DECLARE @Hours FLOAT, @Minutes FLOAT, @Rate FLOAT, @Time FLOAT;
  DECLARE @BillingType Varchar(20), @TripType Varchar(20),@BookingID INT;
  DECLARE @RentalRatesID INT, @TotalAmount FLOAT, @TAmount FLOAT;
  DECLARE @StartTime DATETIME, @EndTime DATETIME, @UserID INT;
  DECLARE @BillingStatus Varchar(20) = 'Successful', @Percentage FLOAT;
  SELECT @UserID=UserID,@TripType=TripType,@StartTime=StartDateTime,@EndTime=EndDateTime
  FROM Trips t INNER JOIN Bookings b ON t.BookingID = b.BookingID WHERE t.TripID = @TripID
   SET @Minutes = DATEDIFF(Minute, @StartTime, @EndTime);
     SET @Hours = @Minutes/60
      IF (@TripType = 'By User')
        BEGIN
          SET @BillingType = 'Debit'
          IF (@Hours < 24)
            BEGIN SET @Time = @Hours; SET @RentalRatesID = 1; END
          ELSE
            BEGIN SET @Time = @Hours/24; SET @RentalRatesID = 2; END
        END
      ELSE IF (@TripType = 'By Owner')
        BEGIN
          SET @BillingType = 'Credit'
          IF (@Hours < 24)
            BEGIN SET @Time = @Hours; SET @RentalRatesID = 3; END
          ELSE
            BEGIN SET @Time = @Hours/24; SET @RentalRatesID = 4; END
        END
    INSERT INTO Billing (TripID, RateID, UserID, BillingStatus, BillingType)
    VALUES (@TripID, @RentalRatesID, @UserID, @BillingStatus, @BillingType)
  END
```

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Automation

End Trip → Billing → Transactions → Wallet

Bills are generated after trip Ends, according to Trip time and Rent type.

Transactions for Users/Owners are recorded after generating Bills.

Bill Amount is debited/credited to Wallet.

	TransactionID	TransactionBy	TransactionAmount	TransactionType	CreatedAt	TransactionStatus
1	1	2	0.8166666666666667	Debit	2020-08-11 09:08:24.770	Successful
2	2	3	1.05	Debit	2020-08-11 09:10:17.047	Successful
3	3	4	1.1666666666666665	Debit	2020-08-11 09:11:00.283	Successful

	BillID	TripID	RateID	UserID	BillingStatus	CreatedAt	BillingType	TotalAmount
1	1	1	1	2	Successful	2020-08-11	Debit	0.8166666666666667
2	3	2	1	3	Successful	2020-08-11	Debit	1.05
3	4	3	1	4	Successful	2020-08-11	Debit	1.1666666666666665

	WalletID	WalletAmount	UserID
1	1	505	1
2	2	508.01666666666665	2
3	3	528.95	3

Triggers

 # Trigger for Billing automation

```
CREATE Trigger [dbo].[AfterEndTrip]
 ON Trips
 AFTER UPDATE
 AS
   BEGIN
     DECLARE @LatestEndedTripID INT;
     SELECT  TOP 1 @LatestEndedTripID =  inserted.TripI
     FROM inserted
     EXECUTE [dbo].[AddBilling] @LatestEndedTripID;
   END
```

 # Trigger For Automating Transaction and Wallet Amount

```
CREATE Trigger [dbo].[AfterBillingUpdates]
 ON Billing
 AFTER INSERT
 AS BEGIN
     DECLARE @LatestBillingID INT;
     DECLARE @TransactionBy INT;
     DECLARE @TransactionAmount FLOAT;
     DECLARE @TransactionType Varchar(20);
     SELECT  TOP 1 @LatestBillingID = inserted.BillID
     FROM inserted
     SELECT @TransactionBy= [UserID],
     @TransactionAmount=[TotalAmount],
     @TransactionType = [BillingType]
     FROM Billing WHERE BillID = @LatestBillingID
     EXECUTE dbo.AddTransactions @TransactionBy,
     @TransactionAmount, @TransactionType ;
   END
```

 # Trigger for Booking Cancellation and Wallet constraints

```
CREATE TRIGGER [dbo].[AfterBookingUpdates]
 ON Bookings
 AFTER INSERT,UPDATE
 AS
   BEGIN
     DECLARE @WalletAmount FLOAT
     DECLARE @BookingStatus Varchar(30)
     DECLARE @TransactionBy INT
     DECLARE @TransactionAmount FLOAT
     DECLARE @TransactionType Varchar(20)
     DECLARE @BookingID INT
     Select @WalletAmount= [WalletAmount] FROM [Wallet] WHERE UserID =
     (SELECT inserted.UserID FROM inserted)
     IF EXISTS (SELECT inserted.BookingID FROM inserted) AND EXISTS
     (SELECT deleted.BookingID FROM deleted)
       BEGIN
         SELECT @BookingStatus=[BookingStatus], @TransactionBy=[UserID]
         FROM Bookings WHERE BookingID = (SELECT inserted.BookingID FROM inserted)
         IF @BookingStatus = 'Cancelled'
           EXECUTE dbo.AddTransactions @TransactionBy,@TransactionAmount=10,
           @TransactionType = 'Debit';
       END
     ELSE
       BEGIN
         IF @WalletAmount < 500
           BEGIN
             ROLLBACK TRAN
             RAISERROR('Booking Failed ! Wallet Amount is less than 500,
             add money to your wallet',16,1)
           END
       END
   END
```

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Table Level Check


```
# For validation user has wallet amount more than 500/- at the time of booking

CREATE FUNCTION WalletBalanceCheck (@UserID INT)
 RETURNS FLOAT
 AS
 BEGIN
   DECLARE  @Balance FLOAT;
   (SELECT @Balance = WalletAmount FROM dbo.Wallet
   WHERE UserID = @UserID)
   RETURN @Balance
 END;

# Adding Contraints
ALTER TABLE dbo.Bookings
ADD CONSTRAINT WalletBalanceOfUser
CHECK(dbo.WalletBalanceCheck(UserID) > 500)
```

```
# Check user has age greater than 14 at the time of registration

CREATE FUNCTION CheckAge (@UserID INT)
 RETURNS INT
 AS
 BEGIN
   DECLARE @Age INT;
   SET @Age = dbo.CalculateAge(@UserID)
   RETURN @Age
 END;

# Adding Contraints
 ALTER TABLE Users
 ADD CONSTRAINT CheckAgeOfUser CHECK
(dbo.CheckAge(UserID) > 14)
```

Messages

```
22:13:02    Started executing query at Line 584
            Msg 547, Level 16, State 0, Procedure dbo.AddUpdateUser, Line 32
            The INSERT statement conflicted with the CHECK constraint "CheckAgeOfUser". The conflict occurred in database "pedal", table "dbo.Users", column 'UserID'.
            The statement has been terminated.
            Total execution time: 00:00:00.254
22:09:21    Started executing query at Line 838
            Msg 547, Level 16, State 0, Line 2
            The INSERT statement conflicted with the CHECK constraint "WalletBalanceOfUser". The conflict occurred in database "pedal", table "dbo.Bookings", column 'UserID'.
            The statement has been terminated.
            Total execution time: 00:00:00.262
```

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Computed Columns


```
# Calculate Total Amount for Billing
CREATE FUNCTION CalculateTotalAmount(@TripID INT, @RentalRatesID INT)
RETURNS FLOAT
AS BEGIN
   DECLARE @Hours FLOAT, @Minutes FLOAT, @Rate FLOAT, @Time FLOAT;
   DECLARE @TripType Varchar(20);
   DECLARE @TotalAmount FLOAT, @TAmount FLOAT, @UserID INT, @Percentage FLOAT, @BookingID INT;
   DECLARE @StartTime DATETIME, @EndTime DATETIME;

   SELECT @StartTime=[StartDateTime], @EndTime=[EndDateTime] , @BookingID = b.BookingID, @TripType=[TripType]
   FROM Trips t INNER JOIN Bookings b ON t.BookingID = b.BookingID
   WHERE t.TripID = @TripID

   SELECT @Percentage = (SELECT [Percentage] FROM Discount d INNER JOIN Bookings b ON d.DiscountID =
   b.DiscountID WHERE b.BookingID = @BookingID)
   SET @Minutes = DATEDIFF(Minute, @StartTime, @EndTime);
   SET @Hours = @Minutes/60
   IF (@Hours < 24)
     SET @Time = @Hours;
   ELSE
     SET @Time = @Hours/24;
   IF @Percentage IS NULL SET @Percentage = 0.0
   SELECT @Rate = (SELECT Rate FROM RentalRates WHERE RentalRatesID = @RentalRatesID)
   SET @TAmount = @Rate * @Time
   SET @TotalAmount = @TAmount - (@Percentage*@TAmount)/100
   RETURN @TotalAmount
 END
```

Formula

Views

```
# View for Wallet details of User
CREATE VIEW User_Wallet
AS
    SELECT U.UserID, W.WalletID,
      U.FirstName, U.LastName,
      W.WalletAmount
    FROM Users U
    JOIN Wallet W
  ON U.UserID = W.UserID
```

```
#View to report the availability of bikes at respective Stations

  CREATE VIEW [Bike_Available]
    AS SELECT DISTINCT B.StationID [StationID], S.Name,
                  STUFF((SELECT  DISTINCT ',  '+
                 RTRIM(CAST(BikeID AS CHAR))
      FROM BikeStations BS
      WHERE BS.StationID = B.StationID
                    AND  BikeStatus ='Available'
      FOR XML PATH('')) ,1, 1, '') AS 'Bike IDs'
    FROM BikeStations B
    INNER JOIN Stations S
    ON S.StationID = B.StationID
```

	UserID	WalletID	FirstName	LastName	WalletAmount
1	4	1	Pavan	pati	523.6
2	13	8	james	bond	999
3	14	9	james	bond	0
4	5	10	Abhishek	Satbhai	505
5	6	11	Krishna	Pallela	505

User_Wallet

	StationID	Name	Bike IDs
1	3	Pedal 1	11
2	4	pedal 2	4
3	5	pedal 3	4
4	6	pedal 4	6
5	7	pedal 5	4

Bike_Available

Views

```
# VIEW to categorise Age Groups for Reporting
CREATE VIEW CalculateAgegroup
AS
  SELECT UserID, Age,
   CASE
    WHEN Age BETWEEN 14 AND 19 THEN '14-19'
    WHEN Age BETWEEN 20 AND 25 THEN '20-25'
    WHEN Age BETWEEN 26 AND 30 THEN '26-30'
    WHEN Age BETWEEN 31 AND 40 THEN '31-40'
   END AS [Age group]
  FROM Users
```

```
# View for Logging Trips on each Booking for Users
CREATE VIEW User_Booking_Details
AS
  SELECT U.UserID, U.Username, B.BookingID,
      B.purpose, B.ridedate,T.StartBikeStationID,
      T.EndBikeStationID
  FROM Users U
          JOIN Bookings B
          ON U.UserID = B.UserID
          JOIN Trips T
          ON B.BookingID = T.BookingID
```

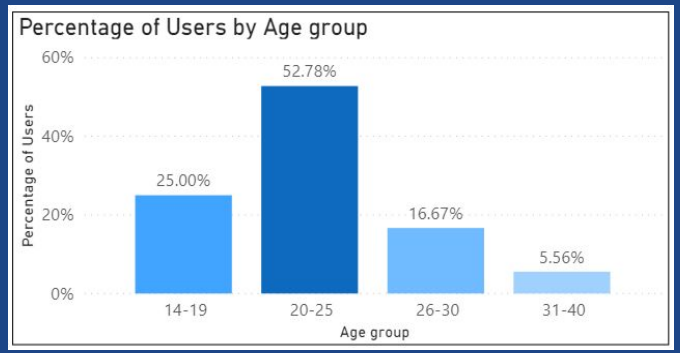
	UserID	Age	Age group
1	5	24	20-25
2	43	17	14-19
3	21	22	20-25
4	9	23	20-25
5	32	30	26-30

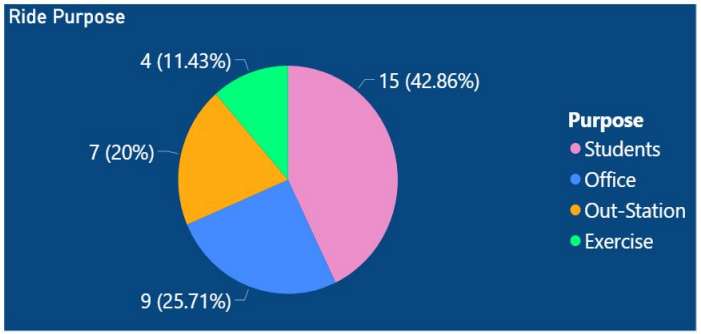
CalculateAgeGroup

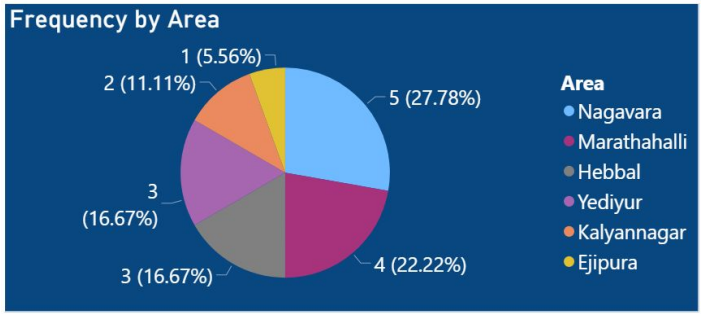
	userid	username	bookingid	purpose	ridedate	Startbikestationid	endbikestationid
1	4	Pavan22	1	Office	2020-06-01	1	2
2	4	Pavan22	2	Office	2020-06-01	2	1
3	5	abhi001	3	Exercise	2020-08-01	3	2
4	13	jb007	20	office	2020-08-07	4	3
5	13	jb007	21	office	2020-08-07	5	4

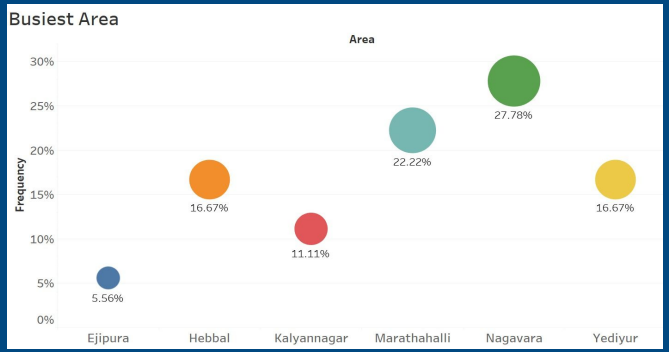
User_Booking_Details

Analytics









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Thank you
Q/A

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