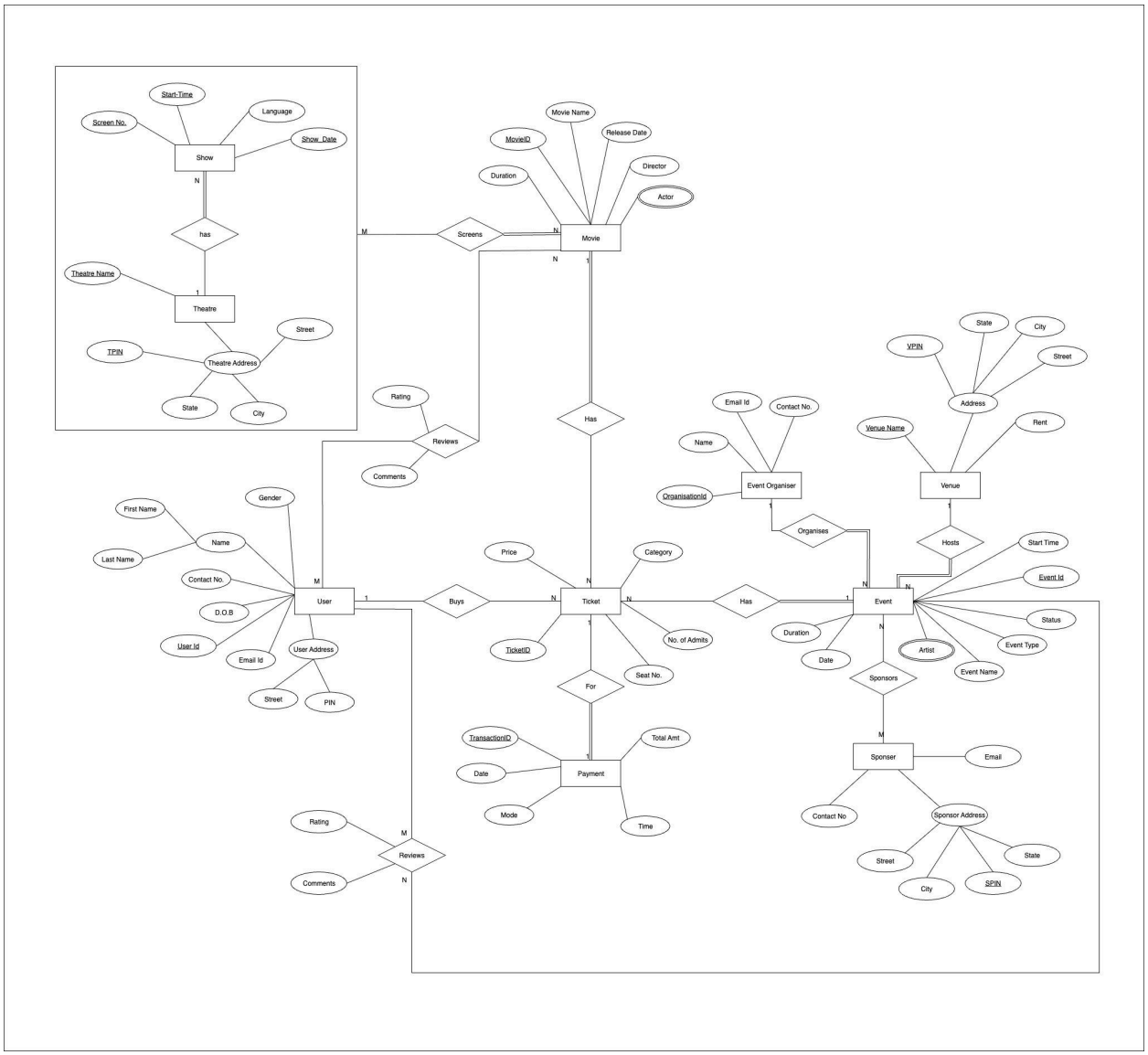
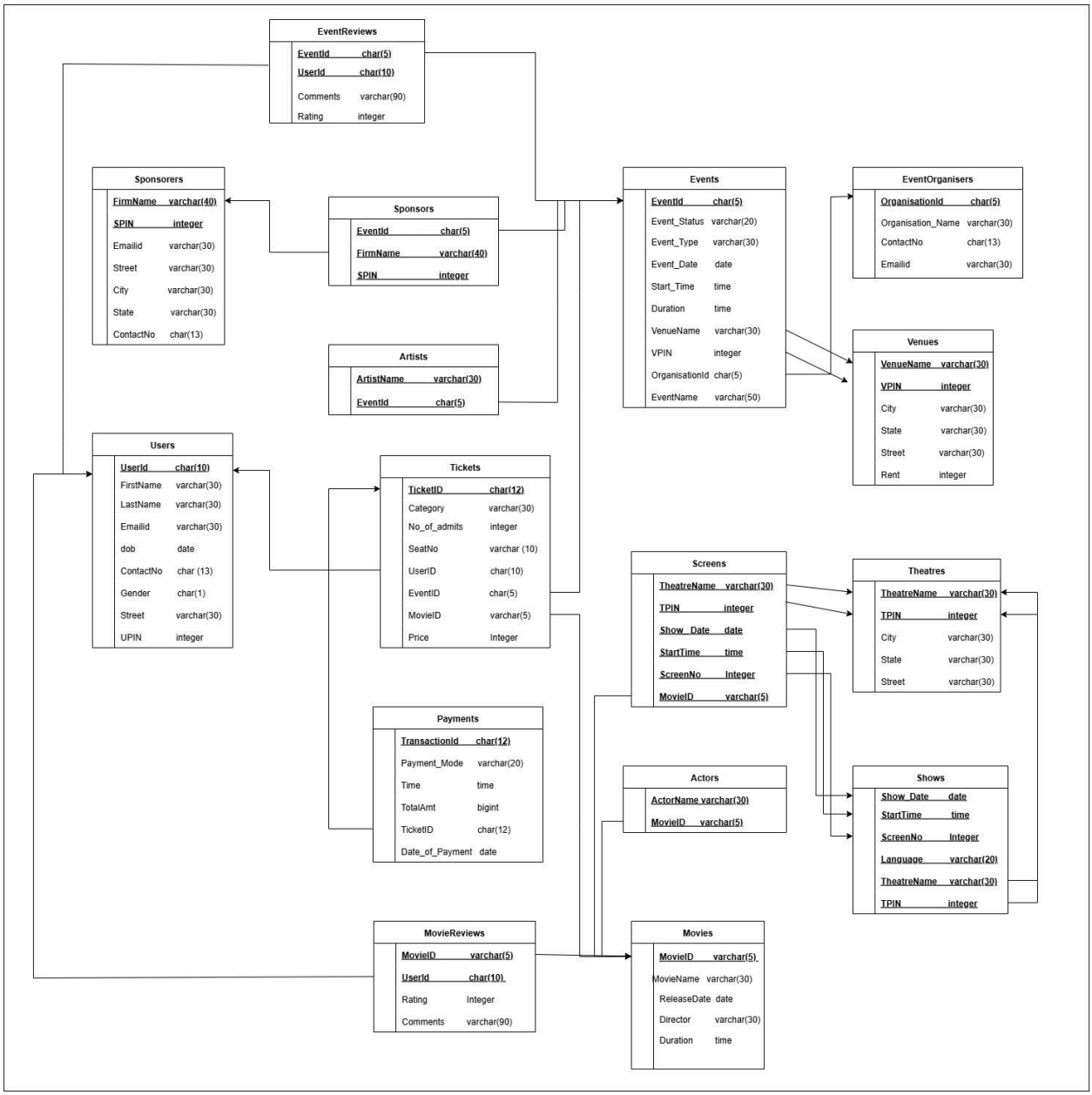
# ER Diagram


Start-Time
Language
Screen No.
Show_Date
Show
N
has
1
Theatre Name
Theatre
Street
TPIN
Theatre Address
State
City
M
Screens
N
Movie Name
Release Date
MovieID
Director
Duration
Actor
Movie
N
1
Rating
Reviews
Comments
Has
Email Id
Contact No.
Name
Event Organiser
OrganisationId
State
City
VPIN
Street
Address
Venue Name
Rent
Venue
First Name
Gender
Name
Last Name
Contact No.
D.O.B
User Id
Email Id
User Address
Street
PIN
M
User
1
Buys
N
Price
Category
Ticket
TicketID
No. of Admits
Seat No.
1
For
N
Has
1
N
Organises
1
Hosts
1
Start Time
Event Id
Event
N
N
Duration
Date
Status
Event Type
Artist
Event Name
Sponsors
N
TransactionID
Total Amt
Date
Payment
Mode
Time
1
M
Sponser
Email
Contact No
Sponsor Address
Street
State
City
SPIN
Rating
Reviews
Comments
M
N

# Relational Schema



## Proof that relations are in Boyce-Codd Normal Form

### 1. ‘Users’ relation :

- Attribute :
  Users { UserId, FirstName, LastName, Emailid, dob, ContactNo., Gender, Street, UPIN }

- Functional dependencies :
  UserId->FirstName
  UserId->LastName
  UserId->Emailid
  UserId->dob
  UserId->ContactNo.
  UserId->Gender
  UserId->Street
  UserId->UPIN

Let X = UserId ,
Computing the closure,
$X^+$ = { UserId , FirstName , LastName , Emailid , dob , ContactNo , Gender ,Street , UPIN }
Thus, **Primary key = UserId**

The left side of all the FDs in the minimal set of FDs for the relation ‘Users’ is UserId, which is the primary key of this relation, so **“Users” is in BCNF**.

### 2. ‘Tickets’ relation :

- Attribute :
  Tickets { TicketID, Price, Category, No_of_admits, SeatNo., UserID, EventId, MovieID }

- Functional dependencies :
  TicketID->Price
  TicketID->Category
  TicketID->No_of_admits
  TicketID->SeatNo.
  TicketID->UserID
  TicketID->EventID
  TicketID->MovieID

Let X = TicketID ,
Computing the closure,
$X^+$ = { TicketID, Price, Category, No_of_admits, SeatNo., UserID, EventId, MovieID }
Thus, **Primary key = TicketID**

The left side of all the FDs in the minimal set of FDs for the relation 'Tickets' is TicketID, which is the primary key of this relation, so **"Tickets" is in BCNF**.

### 3. 'Events' relation :

- Attribute :
  Events { EventId, EventName, Event_Status, Event_Type, Event_Date, Start-Time, Duration, OrganisationId, VenueName, VPIN}

- Functional dependencies :
  EventId->EventName
  EventId->Event_Status
  EventId->Event_Type
  EventId>Event_Date
  EventId->Start-Time
  EventId->Duration

EventId->OrganisationId
EventId->VenueName
EventId->VPIN

Let X = EventId ,
Computing the closure,
$X^+$ = { EventId, EventName, Event_Status, Event_Type, Event_Date, Start-Time, Duration, OrganisationId, VenueName, VPIN }
Thus, **Primary key = EventId**

The left side of all the FDs in the minimal set of FDs for the relation 'Events' is EventId , which is the primary key of this relation, so **"Events" is in BCNF**.

### 4. 'Sponsorers' relation :

- Attribute :
  Sponsorers { FirmName, SPIN, ContactNo., Emailid, Street, City, State }

- Functional dependencies :
  {FirmName,SPIN}->ContactNo
  {FirmName,SPIN}->Street
  {FirmName,SPIN}->City
  {FirmName,SPIN}->State
  {FirmName,SPIN}->Emailid

Let X = {FirmName,SPIN} ,
Computing the closure,
$X^+$ = { FirmName, SPIN, ContactNo., Emailid, Street, City, State }
Thus, **Primary key = { FirmName,SPIN }**

The left side of all the FDs in the minimal set of FDs for the relation 'Sponsorers' is {FirmName,SPIN}, which is the primary key of this relation, so **"Sponsorers" is in BCNF**.

## 5. ‘Movies’ relation :

- Attribute :
  Movies { MovieID, MovieName, ReleaseDate, Director, Duration}

- Functional dependencies :
  MovieID -> MovieName
  MovieID -> ReleaseDate
  MovieID -> Director
  MovieID -> Duration

Let X = MovieID ,
Computing the closure,
$X^+$ = { MovieID, MovieName, ReleaseDate, Director, Duration }
Thus, **Primary key = MovieID**

The left side of all the FDs in the minimal set of FDs for the relation ‘Movies’ is MovieID, which is the primary key of this relation, so **“Movies” is in BCNF**.

## 6. ‘Venues’ relation :

- Attribute :
  Venues { VenueName, VPIN, City, State, Street, Rent }

- Functional dependencies :
  {VenueName,VPIN}->City
  {VenueName,VPIN}->Street
  {VenueName,VPIN}->State

{VenueName,VPIN}->Rent

Let X = {VenueName,VPIN} ,
Computing the closure,
$X^+$ = { VenueName, VPIN, City, State, Street, Rent }
Thus, **Primary key = { VenueName,VPIN }**

The left side of all the FDs in the minimal set of FDs for the relation 'Venues' is {VenueName,VPIN}, which is the primary key of this relation, so **"Venues" is in BCNF**.

## 7. 'Payments' relation :

- Attribute :
  Payments { TransactionId, Date_of_Payment, Payment_Mode, Time, TotalAmt, TicketID }

- Functional dependencies :
  TransactionID->Date_of_Payment
  TransactionID->Payment_Mode
  TransactionID->Time
  TransactionID->TotalAmt
  TransactionID->TicketID

Let X = TransactionID ,
Computing the closure,
$X^+$ = { TransactionId, Date_of_Payment, Payment_Mode, Time, TotalAmt, TicketID }
Thus, **Primary key = TransactionID**

The left side of all the FDs in the minimal set of FDs for the relation 'Payments' is TransactionID, which is the primary key of this relation, so **"Payments" is in BCNF**.

## 8. ‘Theatres’ relation :

- Attribute :
  Theatres { TheatreName, TPIN, City, State, Street }

- Functional dependencies :
  {TheatreName,TPIN}->City
  {TheatreName,TPIN}->Street
  {TheatreName,TPIN}->State

Let X = {TheatreName,TPIN} ,
Computing the closure,
$X^+$ = { TheatreName, TPIN, City, State, Street }
Thus, **Primary key = { TheatreName,TPIN }**

The left side of all the FDs in the minimal set of FDs for the relation ‘Theatres’ is {TheatreName,TPIN}, which is the primary key of this relation, so **“Theatres” is in BCNF**.

## 9. ‘EventOrganisers’ relation :

- Attribute :
  EventOrganisers { OrganisationID, Organisation_Name, ContactNo., Emailid }

- Functional dependencies :
  OrganisationID->Organisation_Name
  OrganisationID->ContactNo.
  OrganisationID->Emailid

Let X = OrganisationID,
Computing the closure,
$X^+$ = { OrganisationID, Organisation_Name, ContactNo., Emailid }
Thus, **Primary key = OrganisationID**

The left side of all the FDs in the minimal set of FDs for the relation 'EvenOrganisers' is OrganisationID, which is the primary key of this relation, so **"EventOrganisers" is in BCNF**.

### 10. 'Movie_Reviews' relation :

- Attribute :
  Movie_Reviews { UserId, MovieID, Rating, Comments }

- Functional dependencies :
  {UserId,MovieID} -> Rating
  {UserId,MovieID} -> Comments

Let X = {UserId,MovieID},
Computing the closure,
$X^+$ = { UserId, MovieID, Rating, Comments }
Thus, **Primary key = { UserId,MovieID }**

The left side of all the FDs in the minimal set of FDs for the relation 'Movie_Reviews' is {UserId,MovieID}, which is the primary key of this relation, so **"Movie_Reviews" is in BCNF**.

### 11. 'Event_Reviews' relation :

- Attribute :
  Event_Reviews { UserId, EventId, Rating, Comments }

- Functional dependencies :
  {UserId, EventId} -> Rating
  {UserId, EventId} -> Comments

Let X = { UserId, EventId },
Computing the closure,
$X^+$ = { UserId, EventId, Rating, Comments }
Thus, **Primary key = { UserId, EventId }**

The left side of all the FDs in the minimal set of FDs for the relation 'Event_Reviews' is {UserId, EventId}, which is the primary key of this relation, so **"Event_Reviews" is in BCNF**.

## 12. 'Screens' relation :

- Attribute :
  Screens { MovieID, TheatreName, TPIN, Show_Date, Start-Time, ScreenNo. }

Here, **Primary key = { MovieID, TheatreName, TPIN, Show_Date, Start-Time, ScreenNo. }**

According to the BCNF Rule, all attribute primary key relations are always BCNF. Hence, **"Screens" is in BCNF**.

## 13. 'Actors' relation :

- Attribute :
  Actors { ActorName, MovieID }

Here, **Primary key = { ActorName, MovieID }**

According to the BCNF Rule,all attribute primary key relations are always in BCNF. Hence **"Actors" is in BCNF**.

## 14. 'Artists' relation :

- Attribute :
  Artists { ArtistName, EventId }

Here, **Primary key = { ArtistName, EventId }**

According to the BCNF Rule,all attribute primary key relations are always in BCNF. Hence **“Artists” is in BCNF**.

### 15. ‘Sponsors’ relation :

- Attribute :
  Sponsors { EventId, FirmName, SPIN }

Here, **Primary key = { EventId, FirmName, SPIN }**

According to the BCNF Rule,all attribute primary key relations are always in BCNF. Hence **“Sponsors” is in BCNF**.

### 16. ‘Shows’ relation :

- Attribute :
  Shows { Show_date, Start-Time, ScreenNo.,Language, TheatreName, TPIN }

- Functional dependencies :
  {Show_date, Start-Time, ScreenNo., TheatreName, TPIN} -> Language

Let X = {Show_date, Start-Time, ScreenNo., TheatreName, TPIN},
Computing the closure,
$X^+$ = { Show_date, Start-Time, ScreenNo.,Language, TheatreName, TPIN }
Thus, **Primary key = {Show_date, Start-Time, ScreenNo., TheatreName, TPIN}**

The left side of all the FDs in the minimal set of FDs for the relation ‘Shows’ is {Show_date, Start-Time, ScreenNo., TheatreName, TPIN}, which is the primary key of this relation, so **“Shows” is in BCNF**.