**DB PROJECT - PHASE 2**

**Updated EER:**

**A picture containing text, map

Description automatically generated**

**Assumptions for Aggregation.**

1**.** Assuming that OVERALLBUSINFO IS DEPENDENT ON ROUTE BUSSTOP TIMETABLE BUS ET

2. OVERALLBUSINFO ET Contains information of BUSSTOP ET too.

**EER to Relational Mapping:**

**Step 8:** Mapping Specialization or Generalization

8a-Multiple Relations-Super classes and subclasses.

**PERSON**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pid** | FirstName | LastName | MiddleName | Address | Gender |

**EMPLOYEE**

|  |  |
| --- | --- |
| **EPid** | StartDate |

EPid is mapped from PERSON ET

**BUSDRIVER**

|  |
| --- |
| **BEPid** |

BEPid is mapped from EMPLOYEE ET

**STAFF**

|  |
| --- |
| **SEPid** |

SEPid is mapped from EMPLOYEE ET

**ACLASSPASSENGER**

|  |
| --- |
| **APid** |

APid is mapped from Person ET

**Step6 :**Mapping of Multi-Valued Attributes

**PERSON\_PHONENUMBER**

|  |  |
| --- | --- |
| **Phone\_Pid** | **PhoneNumber** |

Phone\_Pid is mapped from PERSON ET

**Step 9:** Mapping of union types.For category whose super classes has the same key , there is no need for a surrogate key.

**ASTARPASSENGER**

|  |  |
| --- | --- |
| **ASEPid** | **ASAPid** |

ASEPid is mapped from EMPLOYEE ET and ASAPid is mapped from ACLASSPASEENGER

**Step 1:** Mapping all the Regular entity types

**BUS**

|  |  |  |
| --- | --- | --- |
| BusNo | No\_Seats | **LicenseNo** |

**TERMINAL**

|  |  |  |  |
| --- | --- | --- | --- |
| **TerminalId** | Loc | Date | Time |

**TICKET**

|  |  |  |  |
| --- | --- | --- | --- |
| **TicketId** | BusId | SeatNo | Price |

**PAYMENT**

|  |  |
| --- | --- |
| **PayId** | Method |

**TRAVELCARD**

|  |  |  |
| --- | --- | --- |
| **TravelCardID** | Expiry | Price |

**DARTPASS**

|  |  |  |
| --- | --- | --- |
| **DPassID** | Expiry | Price |

**ROUTE**

|  |  |
| --- | --- |
| **Rid** | RouteName |

**BUSSTOP**

|  |  |
| --- | --- |
| **BsId** | BsName |

**TIMETABLE**

|  |  |  |  |
| --- | --- | --- | --- |
| **TTId** | Day | StTime | endTime |

**Step 2: Mapping of Weak Entity Types**

**CHILDREN**

|  |  |  |
| --- | --- | --- |
| **CAPid** | **CName** | CAge |

CAPid mapped from ACLASSPASSENGER ET

**GUEST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **GASEPid** | **GASAPid** | **GuestId** | GName | ContactInfo |

GASAPid is mapped from ASTARPASSENGER ET

GASEPid is mapped from EMPLOYEE ET

**PROMOTIONS**

|  |  |  |
| --- | --- | --- |
| **PDPassID** | **PromotionId** | PromotionName |

PDPassID is mapped from DARTPASS ET

**OVERALLBUSINFO**

|  |  |  |  |
| --- | --- | --- | --- |
| **ORid** | **OBsId** | **OLicenseNo** | **OTTId** |

ORid is mapped from ROUTE ET, OBsId is mapped from BUSSTOP and OLicenseNo is mapped from BUS ET and OTTId is mapped from TIMETABLE.

**Step 3: Mapping of Binary 1:1 Relationship Types**

**TRAVELCARD**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TravelCardID** | Expiry | Price | TCASAPid | TCASEPid |

ASTARPASSENGER->ASAPid, ASEPid

**Step 4: Mapping of Binary 1:N Relationship Types**

**PAYMENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **PayId** | Method | StaffId | PPid |

STAFF.SEPid PERSON.Pid

**TICKET**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TPid | **TicketId** | BusId | SeatNo | Price | TSEPid |

TPid from Person ET

TSEPid from Staff ET

**TRAVELCARD**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TravelCardID** | Expiry | Price | StaffId | TCASAPid | TCASEPid |

STAFF.SEPid ASTARPASSENGER->ASAPid, ASEPid

**DARTPASS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DPassID** | Expiry | Price | DPSEPid | DPPid |

STAFF.SEPid PERSON.Pid

**Step 5: Mapping of Binary M:N Relationship Types**

**DRIVES**

|  |  |  |  |
| --- | --- | --- | --- |
| **DBEPid** | Date | Hours | **DLicenseNo** |

DBEPid mapped from BusDriver and DLicenseNo mapped from Bus

**PARKED**

|  |  |
| --- | --- |
| **PTerminalId** | **PLicenseNo** |

PTerminalId mapped from Terminal ET and PLicenseNo mapped from Bus

**Contains\_Payment\_Info**

|  |  |
| --- | --- |
| **CPISEPid** | **CPIPid** |

CPISEPid is mapped from STAFF ET and CPIPid is mapped from PERSON ET

**Step 7: Mapping of N-ary Relationship types**

**All the N-ary Relationship types are identifying RT and hence not creating a new Relation for it.**

**FINAL MAPPING OF EER**

**PERSON**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pid** | FirstName | LastName | MiddleName | Address | Gender |

**EMPLOYEE**

|  |  |
| --- | --- |
| **EPid** | StartDate |

**ACLASSPASSENGER**

|  |
| --- |
| **APid** |

**ASTARPASSENGER**

|  |  |
| --- | --- |
| **ASEPid** | **ASAPid** |

**CHILDREN**

|  |  |  |
| --- | --- | --- |
| **CAPid** | **CName** | CAge |

**GUEST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **GASEPid** | **GASAPid** | **GuestId** | GName | ContactInfo |

**BUSDRIVER**

|  |
| --- |
| **BEPid** |

**STAFF**

|  |
| --- |
| **SEPid** |

**BUS**

|  |  |  |
| --- | --- | --- |
| BusNo | No\_Seats | **LicenseNo** |

**TERMINAL**

|  |  |  |  |
| --- | --- | --- | --- |
| **TerminalId** | Loc | Date | Time |

**DRIVES**

|  |  |  |  |
| --- | --- | --- | --- |
| **DBEPid** | Date | Hours | **DLicenseNo** |

**PARKED**

|  |  |
| --- | --- |
| **PTerminalId** | **PLicenseNo** |

**TICKET**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TPid | **TicketId** | BusId | SeatNo | Price | TSEPid |

**DARTPASS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DPassID** | Expiry | Price | DPSEPid | DPPid |

STAFF.SEPid PERSON.Pid

**PAYMENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **PayId** | Method | StaffId | PPid |

STAFF.SEPid PERSON.Pid

**TRAVELCARD**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TravelCardID** | Expiry | Price | StaffId | TCASAPid | TCASEPid |

STAFF.SEPid ASTARPASSENGER->ASAPid, ASEPid

**PROMOTIONS**

|  |  |  |
| --- | --- | --- |
| **PDPassID** | **PromotionId** | PromotionName |

**ROUTE**

|  |  |
| --- | --- |
| **Rid** | RouteName |

**BUSSTOP**

|  |  |
| --- | --- |
| **BsId** | BsName |

**TIMETABLE**

|  |  |  |  |
| --- | --- | --- | --- |
| **TTId** | Day | StTime | endTime |

**OVERALLBUSINFO**

|  |  |  |  |
| --- | --- | --- | --- |
| **ORid** | **OBsId** | OLicenseNo | **OTTId** |

BUS.LicenseNo

**Contains\_Payment\_Info**

|  |  |
| --- | --- |
| **CPISEPid** | **CPIPid** |

STAFF.SEPID PERSON.Pid

**PERSON\_PHONENUMBER**

|  |  |
| --- | --- |
| **Phone\_Pid** | **PhoneNumber** |

PERSON.Pid