**CHAPTER 3**

**SYSTEM DESIGN**

**3.1 E-R Diagram**

Manages

1 1

MANAGER

BBANK

1

Stores

N

1

Orders

Manages

1 N

BLOOD

1

Placed By

M N

ORDERS

HOSPITAL

RECEPTIONIST

Figure 3.1.1 E-R Diagram

**3.2 ER to Relational Mapping**

**Step 1: Mapping of Regular Entity Types**

For each regular entity type, create a relation R that includes all the simple attributes of E.

1. **DONOR :-**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DID | Dname | Sex | Address | Phno |

1. **BLOOD:-**

|  |
| --- |
| Btype |

1. **HOSPITAL:-**

|  |  |  |  |
| --- | --- | --- | --- |
| HID | Hname | Haddress | Hphno |

1. **RECEPTIONIST:-**

|  |  |  |  |
| --- | --- | --- | --- |
| Rname | RID | Rphno | MID |

1. **BBANK:-**

|  |  |  |  |
| --- | --- | --- | --- |
| BID | Btype | Quantity | MID |

1. **MANAGER:-**

|  |  |  |
| --- | --- | --- |
| Mname | MID | Mphno |

1. **ORDERS:-**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Ord\_no | Ord\_date | Btype | Quantity | HID |  |

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

For each weak entity type, create a relation R and include all simple attributes of the entity type as attributes of R.

Table RECEPTIONIST is a weak entity specified in the ER diagram.

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

For each binary 1:1 relationship type, identify relation that correspond to entity types participating in R.

Possible Approaches:

* Foreign key approach.
* Merged relationship approach.
* Cross reference or relationship relation approach.

1:1 relationhip specified between relations MANAGER and BBANK and MANAGER and RECEPTIONIST in the ER diagram.

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

For each regular binary 1:N relation type, identify relation that represents participating entity type at N-side of relationship type, include primary key of other entity type as foreign key in S, include simple attributes of 1:N relationship type as attributes of S.

1:N relationhip specified between relations BBANK and BLOOD , ORDERS and BLOOD in the ER diagram.

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

For each binary M:N relationship type, create a new relation S, include primary key of participating entity types as foreign key attributes in S, include any simple attributes of M:N attributes.

M:N relationhip specified between relations ORDERS and HOSPITAL in the ER diagram.

**Step 6: Mapping of Multivalued attributes.**

For each multivalued attribute, create a new relation, primary key of R is the combination of A and K, if the multivalued attribute is composite, include its simple components.

There is no multivalued attributes specified in the ER diagram.

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

For eachn-ary relationship type R, create a new relation S to represent R , include primary keys of participating entity types as foreign keys, include any simple attributes as attributes.

There is no N-ary relationship types specified in the ER diagram.

* 1. **Schema Diagram**

The database schema of a database system is its structure described in a formal language supported by database management system. The term “schema” refers to the organization of data as a blueprint of how the database is constructed. The formal definition of a database is a set of formulas called integrity constraints imposed on database. These integrity constraints ensure compatibility between parts of the schema. All constraints are expressible in the same language. A database can be considered a structure in realization of the database language. The states of a created conceptual schema are transformed into an explicit mapping, the database schema. This describes how real-world entities are modeled in the database.

**DONOR :-**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DID | Dname | Sex | Address | Phno |

**BLOOD:-**

|  |
| --- |
| Btype |

**HOSPITAL:-**

|  |  |  |  |
| --- | --- | --- | --- |
| HID | Hname | Haddress | Hphno |

**RECEPTIONIST:-**

|  |  |  |  |
| --- | --- | --- | --- |
| Rname | RID | Rphno | MID |

**BBANK:-**

|  |  |  |  |
| --- | --- | --- | --- |
| BID | Btype | Quantity | MID |

**MANAGER:-**

|  |  |  |
| --- | --- | --- |
| Mname | MID | Mphno |

**ORDERS:-**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Ord\_no | Ord\_date | Btype | Quantity | HID |  |

* 1. **Use Case Diagram**

Receptionist

Figure 3.4.1 Receptionist Use-case diagram

Customer

Figure 3.4.2 Customers Use-case diagram

Hospital

Figure 3.4.3 Customers Use-case diagram