PRISON MANAGEMENT SYSTEM

Software Requirements Specification
Data and Applications Project Phase-1
Team BruteForce

Overview

1.1 The Mini-World

The mini-world we have considered is a **Prison**. The database is a **Prison Management System** and its users are the **administration of the prison and the relatives and attorneys** of the prisoners. It can be used for a **multitude of purposes** such as:

- Managing work assignments for each inmate
- Allocating cells and cellmates
- Assigning guards to different wings
- Keeping track of prison violations and appeals
- Documenting visitor details
- Keeping track of prison staff
- Performance statistics of guards and prisoners
- Overall statistics of the prison over a month, year

  Etc.

Database Requirements

2.1 Strong Entity Types

1. Prisoners

The prisoner entity should store data about the prisoners which includes their personal information as well as information about their activities and involvements in the prison.

This information can be modelled using the following attributes:

- Prisoner ID
- Prisoner Name: This is a **composite attribute** comprising of the first name, middle name and the last name
- Date of Birth
- Sex
- Wing
- Cell
- Arrival Date
- Sentence
- Crime: This is a **multivalued attribute -** as the prisoner could be convicted for multiple crimes.
- Blood Group
- Weight
- Height
- Medical History
- Volatility Level: This is a **derived attribute** - It places a number on how dangerous the prisoner is taking into consideration many aspects such as the crimes he got caught for, number and severity of the offences he committed in prison, his performance in the work assignments etc.
- Security Level: This can be one of the following:
    - Normal
    - Solitary Confinement
    - Maximum Security

2. Jobs

Prisoners are often employed in several different jobs while serving their sentence in a penitentiary. Each available job should be modelled as a separate entity with attributes such as:

- Job ID
- Job Name
- Working hours

3. Prison Staff

The prison staff entity type comprises of all staff employed in the prison, and stores their personal information as well as details about their roles in the prison.

The staff can be of two types – Administrative Staff and Guards. **Guards are a subclass** with additional attributes such as the wing they oversee and their shift.

Prison Staff entity type can be modelled using the following attributes:

- Staff ID
- Name**:** This is a **composite attribute** comprising of the first name, middle name and the last name
- Phone
- Address
- Sex
- Date of Birth
- Salary
- Post

The Guard subclass has the following additional attributes:

- Wing assigned
- Shift

The post of a prison staff entity can be exactly one of the following:

- Warden
- Administrative Staff
- Prison Officers
- Probation Officer
- Psychologist
- Education and Workshop Staff
- Healthcare Staff
- Kitchen Staff
- Housekeeping Staff

- Maintenance Staff
- Guards

4. Appeals

The Appeal entity is related to exactly one prisoner and comprises of the following attributes:

- Appeal ID
- Filing Date
- Hearing Date
- Status

The appeal status can be exactly one of the following:

- Filed
- Under review
- Hearing scheduled
- Accepted
- Rejected

These can be viewed by the visitors or attorneys of the prisoners, along with the prison administrative officials.

5. Offences

The offence entities represent internal disciplinary violations by the inmates of the prison. They are associated with the prisoners and guards involved.

They are described by the following attributes:

- Offence ID
- Date - Time
- Location
- Type: This is a **multivalued attribute** because an offence can fall under several categories.
- Severity
- Description

The type of an offence can be one or more of the following:

- Assault
- Attempted Escape
- Felony
- Riots
- Contraband
- Destruction of property
- Insubordination
- Miscellaneous

2.2 Weak Entity Types

1. Emergency Contacts

Emergency contacts are stored for each prisoner with the following attributes:

- Name: This is a **composite attribute** comprising of the first name, middle name and the last name
- Address
- Phone
- Relationship

A combination of the prisoner ID and their name is used to identify the emergency contacts.

A prisoner can have zero or more emergency contacts.

2. Visitors

Every visitor weak entity is associated via an identifying relation to a prisoner entity and stores information about the visitors that come to meet that prisoner. This entity type is described using the following attributes:

- Name**:** This is a **composite attribute** comprising of the first name, middle name and the last name
- Address
- Phone
- Relationship

A combination of the prisoner ID and the name of the visitor is used to identify them.

A prisoner can have zero or more visitors.

2.3 Relationship Types

1. Cellmates

This is a one-to-one partial relation between two prisoner entities. A prisoner may or may not have a cellmate.

2. Guards and Prisoners

This is a partial many-to-many relation between the guards and the prisoners they supervise. They are related by the wing attribute in each entity - the wing the guard supervises and the wing where the prisoner's cell is located.

3. Prison Officers and Guards

This is a partial one-to-many relation between the prison officers and the guards they supervise. Each prison officer may be responsible for zero or more guards. A guard has exactly one supervisor.

4. Appeals and Prisoners

Each appeal is related to exactly one prisoner. A prisoner can have multiple appeals.

5. Incidents

This is a **ternary** relation as it relates the prisoner involved, the guard present at the incident, and the offence entity.

Each incident can be related to one or more prisoners, and zero or more guards.

Prisoners and guards may be involved in multiple incident relations. On the other hand, the mapping between incidents and offence entities is one-to-one and complete.

6. Visits

This is a **ternary** relation between prisoners, visitors and the guards on duty.

Each visit is associated with exactly one prisoner, exactly one visitor of that prisoner and exactly one guard supervising it. Prisoners, visitors and supervising guards can be associated with multiple visits.

The relation also stores an additional attribute: the date and time of the visit.

7. Work Assignment (N > 3)

Each work assignment is a **quaternary** relation which relates a job entity with other entity types involved.

This includes one or more prisoners assigned to that job, zero or more guards on duty and at most one supervising officer, which is an entity of type prison staff and not a member of the guard subclass.

Prisoners, guards and supervising officers can be associated with multiple assignments.

8. Visitors and Prisoners

Each prisoner can have zero or more visitors.

This is the **identifying relation** for the visitor weak entity.

9. Emergency Contacts and Prisoners

Each prisoner can have zero or more emergency contacts.

This is the **identifying relation** for the emergency contact weak entity.

Functional Requirements

3.1 CRUD Operations

1. Create Operations

New prisoners, prison staff and jobs can be added to the database.

Whenever a prisoner commits an offence, an offence entity is added and an incident relation is created to link the guards and the prisoners.

Similarly appeals can be added to the database along with the related prisoner.

On a daily basis, a lot of visitors pay a visit to the inmates. This would involve adding new visit relations.

2. Read Operations

All the information stored in the database is visible to the prison administrative officials and separate views can be created for restricted access by the general public and the attorneys and relatives of the prisoners.

3. Update Operations

All attributes stored in the database can be updated in case the information changes.

As an example, the security level of the prisoner can be changed based on his/her volatility level. One can also modify the jobs of the prisoners, update employee information (E.g. salaries, work hours), change the location of the guards etc. As the prisoners cycle, their cellmates and cell numbers can be changed.

4. Delete Operations

Entities can be removed from the database if they are no longer relevant to the mini-world.

For example, when a job becomes unavailable, it can be deleted from the database. Similarly, prison staff that have left their jobs can be deleted.

Note: Our database also allows to add new possible values for the ‘type’ attribute of offences - this is a functional requirement that makes changes to the data requirements.

5. Prisoner Report

For each prisoner we may generate a prisoner report which shall describe the prisoner information such as sentencing, arrival time, Date of Birth, health information such as height, weight, medical history, etc.

It shall also display the jobs the prisoner has worked and the hours spent thereon.

It will further document any disciplinary violations that the prisoner was involved in. The data can be used to calculate the volatility level of the prisoner and variations in volatility level can be used to derive insights about the psychological health of the prisoner and how to safely handle him/her in the future.

It will also display the prisoner's appeals along with their status such as pending/accepted/rejected etc.

6. Guard Report

For each guard we generate a report that contains the incidents that occurred under that guard, and the jobs that he supervises, along with his working hours, wing assigned etc.

7. Incidents Report

For specified time period (month/year) print a list of the incidents that occurred. This includes the prisoners who were involved, the guards, the time and the location.

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