Project: Commonwealth Games Management Database System

Harshvardhan Vajani (202201413)

Maahi Shah (202201419)

Heet Thakkar (202201431)

Abhishek Abbi (202201438)

Parth Tolani (202201455)

This project proposes a revolutionary approach to managing the Commonwealth Games through a comprehensive database system. This system aims to streamline operations, enhance user experience, and elevate the overall event experience.

Introduction

Current Commonwealth Games management likely involves multiple systems or manual processes, leading to inefficiencies. This project proposes a centralized database system that acts as a single source of truth for all Games-related data.

The system caters to a diverse user base:

- **Public:** Easy access to real-time schedules, results, and general information.
- **Athletes:** Seamless registration, personalized schedules, and relevant updates.
- **Organizing Committee:** Efficient data management for informed decision-making.
- **Venue Managers:** Real-time information for optimal venue operations.

Objectives

The core objective is to design and implement a robust database system that manages all critical aspects of the Commonwealth Games, including:

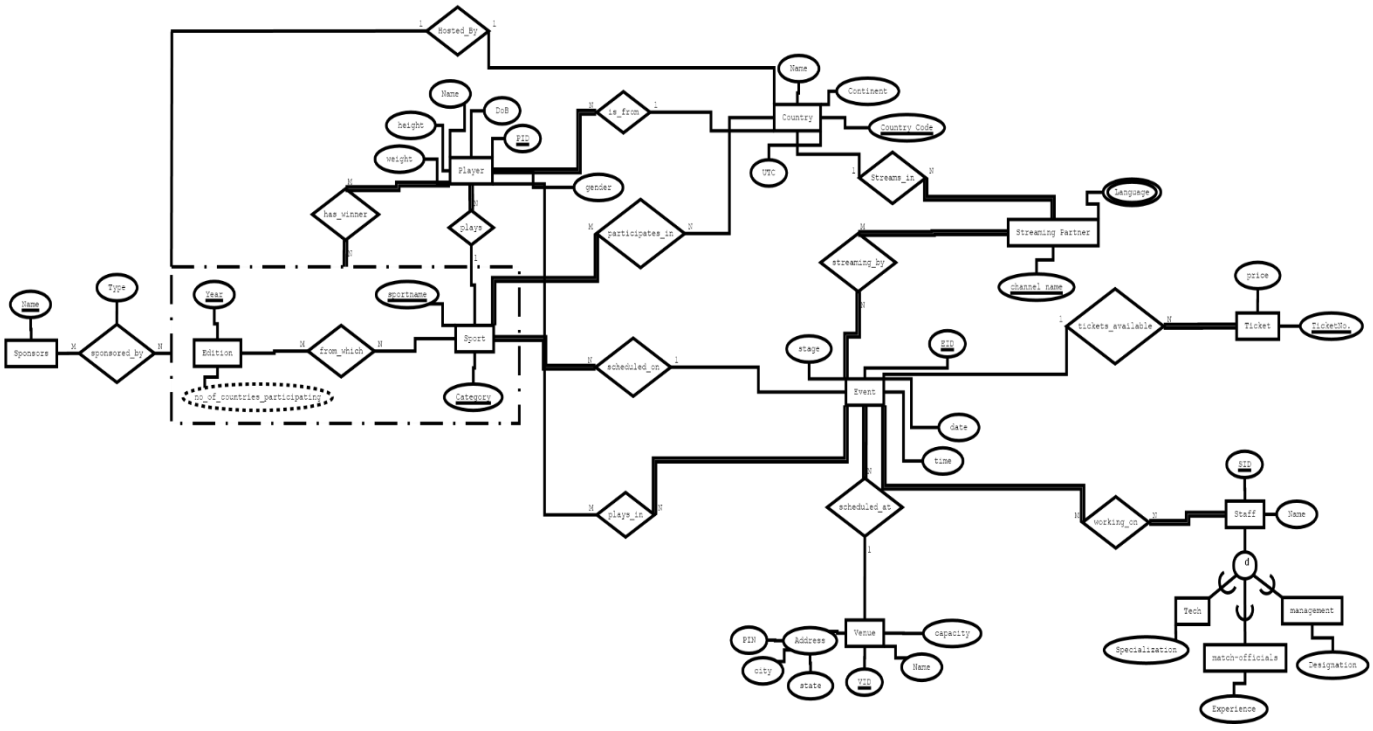
- **Athlete Registration:** Secure and efficient registration process for athletes.

- **Event Scheduling:** Comprehensive scheduling with real-time updates and conflict resolution.
- **Ticketing:** Secure online ticketing platform with seat selection and management functionalities.
- **Venue Management:** Real-time venue information, resource allocation, and operational tools.
- **Result Tracking:** Efficient system for capturing, storing, and displaying competition results.

Expected Outcomes:

- **Enhanced Efficiency:** Streamlined operations through a centralized data platform.
- **Improved User Experience:** Seamless interaction and real-time information access for all users.
- **Informed Decision-Making:** Data-driven insights for better planning and resource allocation.
- **Elevated Event Experience:** Increased transparency and accessibility for athletes, spectators, and organizers.This project presents a significant advancement in Commonwealth Games management, fostering a more efficient, organized, and user-centric experience for athletes, organizers, and the public.

ER DIAGRAM



RELATIONAL SCHEMA

BCNF CONVERSION

TABLE	FUNCTIONAL DEPENDENCIES	BCNF	CONVERSION TO BCNF
Player	player_id -> player_name player_id -> weight player_id -> height player_id -> date_of_birth player_id -> gender player_id -> country_code	☑	
Country	country_code -> country_name country_code -> continent country_code -> timezone country_name -> country_code country_name -> continent country_name -> timezone	☑	
Edition	year -> no_of_countries	☑	
Sponsored_by	{sponsor_name,year} -> type	☑	
Sport	{sport_name,category} -> {sport_name,category}	☑	
Venue	venue_id -> venue_name venue_id - > state venue_id -> city venue_id -> capacity venue_id -> pincode pincode -> city pincode - > state city -> state	☒	Cannot be converted to BCNF as it consists of composite keys.
Event	event_id -> date event_id -> time event_id -> stage event_id -> venue_id event_id -> sport_name event_id -> category	☑	
Sponsors	sponsor_name -> sponsor_name	☑	
Ticket	ticket_no -> price ticket_no -> event_id	☑	

Plays_in	{player_id,event_id} -> {player_id,event_id}	☑	
Streaming_channel	{channel_name,country_code} -> {channel_name,country_code}	☑	
Languages	{channel_name,lang_name} -> {channel_name,lang_name}	☑	
Present_in	{sport_name,category,year} -> {sport_name,category,year}	☑	
Has_winner	{player_id,category,sport_name,year} -> medal_type	☑	
Staff	staff_id -> name	☑	
Tech_staff	staff_id -> specialization	☑	
Management_staff	staff_id -> designation	☑	
Match_official	staff_id -> experience_in_years staff_id -> matches_officiated	☑	
Works_in	{staff_id,event_id} -> {staff_id,event_id}	☑	
Plays_sport	{player_id,sport_name,category} -> {player_id,sport_name,category}	☑	

Proofs and Justifications

In BCNF
The tables player, country, edition, sponsored_by, sport, event, sponsors, plays_in, streaming_channel, languages, present_in, has_winner, staff, tech_staff, management_staff, match_official, Ticket and Works_in are all in BCNF. This is because their primary keys are super keys, meaning that they uniquely determine all other attributes in the table.
NOT in BCNF
The table Venue is not in BCNF. In the Venue table, while venue_id serves as a super key by uniquely determining all other attributes, pincode only functionally determines city and state, and city only functionally determines state, neither of which qualifies as a super key.