Proposal for Final Project

Digital Archive System for Expo 2020 Dubai

Course: CS457(B) - Data Modeling and Implementation Techniques
Submitted by: Umair Dada - 20281

Introduction

Expo 2020, held in Dubai, UAE, was not only a grand cultural and technological event but also a complex infrastructure project involving many contractors, subcontractors, suppliers, and staff. Managing access through Construction Site Passes was essential to ensure security and accountability during the construction phase. This project proposes a Digital Archive System using MySQL to record the event's construction, events, exhibits, and workforce access.

The system will store and validate relationships between contractors, subcontractors, pavilions, materials, and access passes, ensuring structured data for transparency and future reference.

Entities and Relationships

Below are the entities with their attributes and relationships:

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1. Pavilions

- **Attributes:** Pavilion ID, Name, Participating Country, Theme (Mobility, Sustainability, Opportunity), Location, Design Architect, Area (sq.m.), Visitor Count.

- **Relationships:** Must be associated with at least one Contractor. Can also host multiple Events, be linked to Subcontractors, and track Construction Access Passes.

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2. Contractors

- **Attributes:** Contractor ID, Name, Country of Origin, Role (construction, electrical, interior, etc.), Pavilion ID (foreign key to Pavilion table).

- **Relationships:**

  o Must be associated with at least one Pavilion.

  o Works with Subcontractors.

  o Uses products from Material Brands.

  o Linked to Construction Access Passes.

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3. Subcontractors

- **Attributes:** Subcontractor ID, Name, Country of Origin, Specialty (plumbing, HVAC, decoration), Contractor ID (foreign key to Contractor table).

- **Relationships:**

  o Works under specific Contractors.

  o Uses materials provided by the associated Contractor.

  o Linked to Construction Access Passes.

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4. Material Brands

- **Attributes:** Brand ID, Name, Supplier Country, Product Types (drills, hammers, electrical components, steel).

- **Relationships:** Provides products to Contractors or Subcontractors involved in Pavilion construction.

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5. Products

- **Attributes:** Product ID, Name, Type (equipment, steel, electrical components), Brand ID (foreign key to Material Brands table), Contractor or Subcontractor ID.

- **Relationships:** Linked to Material Brands, associated with specific Contractors or Subcontractors.

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6. Construction Access Passes

- **Attributes:** Pass ID, Holder Name, Role (contractor, subcontractor, Expo staff), Date Issued, Validity Period, Linked Pavilion, Linked Entity (Contractor, Subcontractor, or Expo Management).

- **Relationships:**

  o Linked to either **Pavilion, Contractor, Subcontractor**, or **Expo Management Staff**.

  o Used to regulate site access during construction and operations.

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7. Expo Management Staff

- **Attributes:** Staff ID, Name, Department (security, logistics, operations), Role (manager, coordinator, security personnel), Contact Information.

- **Relationships:**

  o Linked to **Construction Access Passes** as a valid entity.

  o Works with Contractors, Subcontractors, and Pavilion teams to oversee site operations.

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8. Participating Countries

- **Attributes:** Country ID, Name, Continent, Pavilion Count, Theme Focus (Mobility, Sustainability, etc.), Government Representatives.

- **Relationships:** Associated with specific Pavilions and Events.

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9. Events

- **Attributes:** Event ID, Name, Type (conference, cultural performance, seminar), Date, Location, Associated Pavilion, Participating Speakers.

- **Relationships:** Hosted in Pavilions, linked to Participating Countries, attended by Visitors and Researchers.

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10. Exhibits

- **Attributes:** Exhibit ID, Title, Description, Category (technology, art, culture), Pavilion Hosted, Duration (start date - end date), Curator Name.

- **Relationships:** Linked to Pavilions and Participating Countries, contributed to Events and documented in archives.

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11. Visitors

- **Attributes:** Visitor ID, Name, Nationality, Ticket Type (general, VIP), Interests, Feedback, Visited Pavilions.

- **Relationships:** Visited Pavilions, attended Events, provided feedback on Exhibits and Experiences.

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12. Sponsors and Authorities

- **Attributes:** Sponsor ID, Name, Type (government, corporate, NGO), Role (funding, management), Pavilion Sponsored, Contribution Amount.

- **Relationships:** Funded Pavilion construction or Exhibits, hosted or sponsored Events.

Relationships Example (Data Flow for Construction)

1. Each **Pavilion** must be linked to one or more **Contractors** responsible for its construction.

2. **Contractors** hire **Subcontractors** to handle specialized tasks such as plumbing, HVAC, or interior design.

3. Contractors and Subcontractors use materials from brands like **CAT** (for tools) and **FISCHER** (for steel components).

4. All contractors, subcontractors, and Expo staff members are assigned **Construction Access Passes** to regulate access to specific pavilions and construction zones.

5. **Expo Management Staff** oversee the coordination between contractors, subcontractors, and logistics teams to ensure smooth operations.

Conclusion

The Digital Archive System for Expo 2020 Dubai will provide a comprehensive and organized way to document pavilions, construction processes, material use, and workforce access through Construction Access Passes. The inclusion of Expo Management Staff ensures that all construction personnel are validly tracked and coordinated.

By developing this system in MySQL, we ensure accurate data storage and accessibility for audits, research, and future reference. This system will serve as a model for managing large-scale infrastructure projects, preserving Expo 2020's legacy for years to come.