Component 2: Interactive Artifact & Comparison Engine

Description:
This component enables visitors to explore artifacts interactively through zoom, hotspots, and detailed explanations. It also supports cross-cultural comparisons between Sri Lankan artifacts and those from other civilizations, offering users rich contextual understanding and deeper cultural appreciation. All explanations are provided in English.

How It Works:

Artifact Exploration

- Visitors can tap or hover on artifacts to access detailed information.

- Hotspots highlight key regions (engraving, materials, design details) with pop-up explanations.

- Zoom features allow closer inspection of intricate details and craftsmanship.

Comparison Module

- Enables side-by-side comparisons with similar artifacts from other cultures.

- Highlights design, material, purpose, and cultural significance differences and similarities.

- Uses your artifact dataset and optionally curated global datasets for contextual comparison.

English Narration

- AI-powered explanations provide both factual descriptions and interpretive insights.

- Narration summarizes cultural, historical, and ritual significance of each artifact and its comparisons.

Interactive Flow

1. User selects an artifact → hotspots and zoom features become active.

2. User clicks "Compare" → system retrieves similar artifacts from dataset(s).

3. Side-by-side visuals and contextual notes are displayed.

4. AI-generated summary explains design, ceremonial use, symbolism, and historical context.

Tasks to Develop:

1. **Hotspot Mapping & Overlays**

   ○ Identify key regions on artifact images.

   ○ Overlay clickable hotspots with detailed pop-up information.

2. **Comparison Engine**

   ○ Match artifacts with similar examples (using metadata, embeddings, or curated links).

   ○ Display side-by-side visuals and highlight comparison points.

3. **AI Integration**

   ○ Use a trained LLM to generate dynamic, context-aware explanations and comparisons in English.

   ○ Train the model with your artifact dataset to understand materials, cultural significance, historical context, and cross-cultural similarities.

Example Use Case:

● Visitor taps a Kandyan sword → sees materials, engravings, and ceremonial meaning.

● Chooses "Compare" → system shows a Japanese katana side-by-side.

● AI generates a summary comparing blade design, ceremonial use, historical context, and symbolism.

Outcome / Novelty:
Transforms static artifact viewing into dynamic cultural exploration. By leveraging a trained AI model, the system generates insightful, context-aware comparisons in English, allowing users to explore Sri Lankan and global heritage interactively without manually writing explanations for every artifact pair.