AUGMENTED REALITY FOR INDIAN HISTORY EDUCATION

Project Reference No.: *49S_BE_3073*

College : *Nitte Meenakshi Institute of Technology, Bengaluru*
Branch : *Department of Information Science and Engineering*
Guide : *Ms. Vani E S*
Student(s) : *Mr. Atharva S A*

Keywords:
Augmented Reality, WebAR, History Education, NCERT, Multilingual Learning, 3D Visualization

Introduction:

India's NCERT history curriculum includes numerous monuments, but students are limited to static 2D textbook images that fail to convey depth, scale, and spatial structure. This reduces conceptual understanding and retention.

This project proposes a Web-based Augmented Reality (WebAR) system that allows students to visualize historical monuments as interactive 3D models directly in a mobile browser without requiring app installation. The system is designed specifically for Indian classrooms, supporting multilingual content (English, Hindi, Kannada) and functioning on budget smartphones.

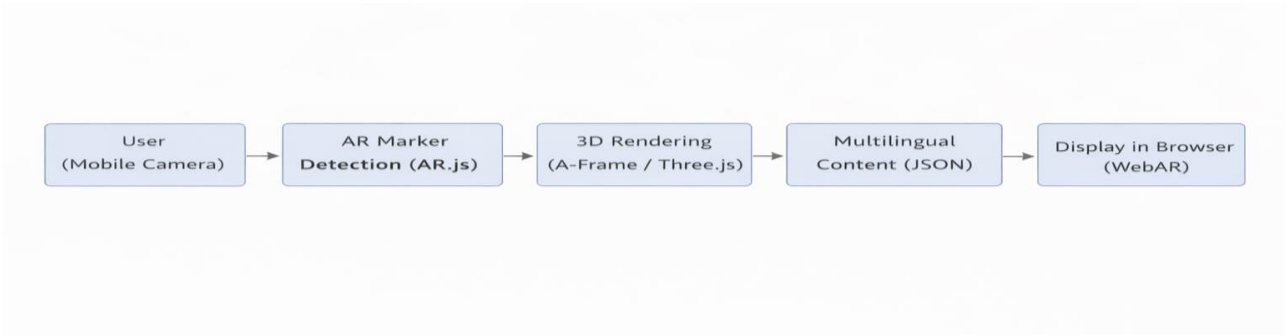

Figure 1: Liv-AR System Architecture

Objectives:

1. To develop a zero-install WebAR platform for history education
2. To visualize NCERT monuments as interactive 3D models
3. To support multilingual learning (English, Hindi, Kannada)
4. To ensure compatibility with budget Android smartphones

Methodology:

The project follows a user-centered iterative development approach:

- Analyze NCERT curriculum and select key monuments
- Optimize 3D models using Blender and Draco compression
- Generate AR markers using AR.js tools
- Develop WebAR system using AR.js, A-Frame, and Three.js

- Implement multilingual content using JSON-based architecture
- Conduct evaluation using a pre/post-test study

Result and Conclusion:

The system demonstrated effective performance on budget devices, achieving 2–3 seconds model load time and 26–29 FPS. A pilot study showed a **22% improvement in student test scores**, indicating better understanding and retention.

The project proves that WebAR is a practical, scalable, and accessible solution for enhancing history education in India without requiring specialized hardware or applications.

References:

- Wu et al., “Meta-analysis of AR in education,” 2020
- Billinghurst et al., “WebAR systems,” 2019
- Radu et al., “AR on low-end devices,” 2021
- Ibanez et al., “Multilingual AR education,” 2020

Future Scope:

The future scope of this project includes:

1. Add offline support using Progressive Web App (PWA) technology
2. Integrate with DIKSHA QR codes in NCERT textbooks
3. Expand to more monuments and additional Indian languages