

Deptford Virtual Sound Voyage: Design an Immersive 4K Experience with Spatial Audio for Global Explorers

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Deptford Peoples Heritage Museum

Abstract

The Deptford People's Museum project uses advanced technology to showcase Deptford's history and culture. With 4K immersive videos and panoramic audio, viewers experience a genuine auditory and visual journey. Based on thorough research and testing, the Unity-based project ensures a seamless large-screen digital interaction experience and enables development for platforms like Android TV and Apple TV (tvOS).

Introduction & Background

Founded by passionate locals and deeply rooted in colonial history, the Deptford People's Heritage Museum is a non-profit dedicated to preserving Deptford's endangered historical landmarks. As these crucial heritages face the threat of fading away, the museum harnesses digital technology to protect and showcase these treasures. While the blend of spatial audio technology and visual interaction offers immense promise, its full potential in historical and cultural exhibitions has yet to be realized. Through this project, the Deptford People's Heritage Museum and I are determined to bring Deptford's rich auditory history to a broader audience by using modern digital storytelling techniques.

Study Methodology

1. Knowledge Preparation:

- 1.1. Survey the spatial audio market.
- 1.2. Master audio production techniques.
- 1.3. Understand human audio-visual attention dynamics.

2. Technical Exploration:

- 2.1 Objective: Classify sounds by the human attention mechanism.
- 2.2 Method : Develop demo samples and evaluate through a questionnaire scale.
- 2.3 Data analyse with a result analysis report to conclude the findings.

3. Asset Collection:

- 3.1 Conduct a focus group on Deptford's history and culture.
- 3.2 Take a guided walking tour of Deptford heritage sites.
- 3.3 Systematize and categorize available stories and materials.

Testing & Evaluation

Applying a questionnaire scale and conducting interviews to evaluate the user experience for 5 participants. The main testing results are based on the following four aspects:

A. Technical Testing:

1. Audio-Visual Evaluation: Assessed the combined audio-visual experience in the Deptford tour.
2. Technical Review: Examined the implementation of panoramic audio and Unity-based design stability.

B. Content Testing:

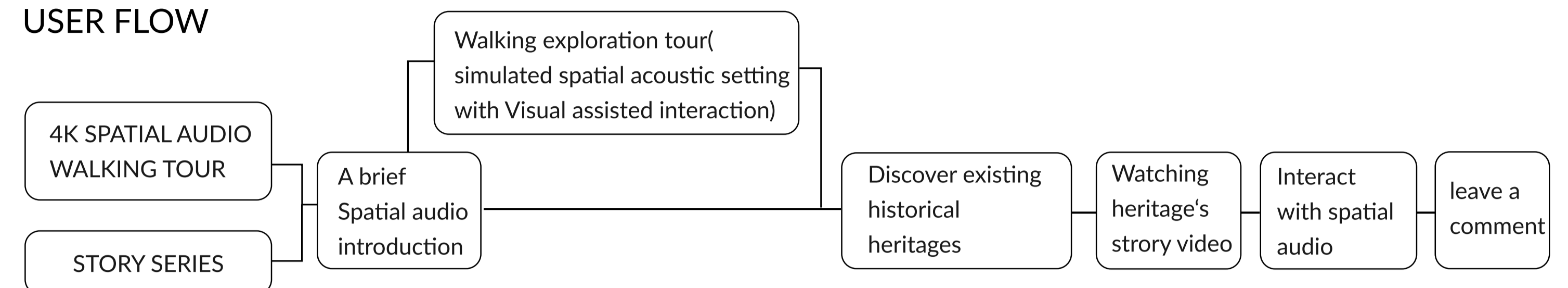
1. Information & Logic: Assessed product's information structure and operation flow.
2. Narrative & Emotion: Verified the coherency of the storytelling and the emotional experience.

C. Performance Testing:

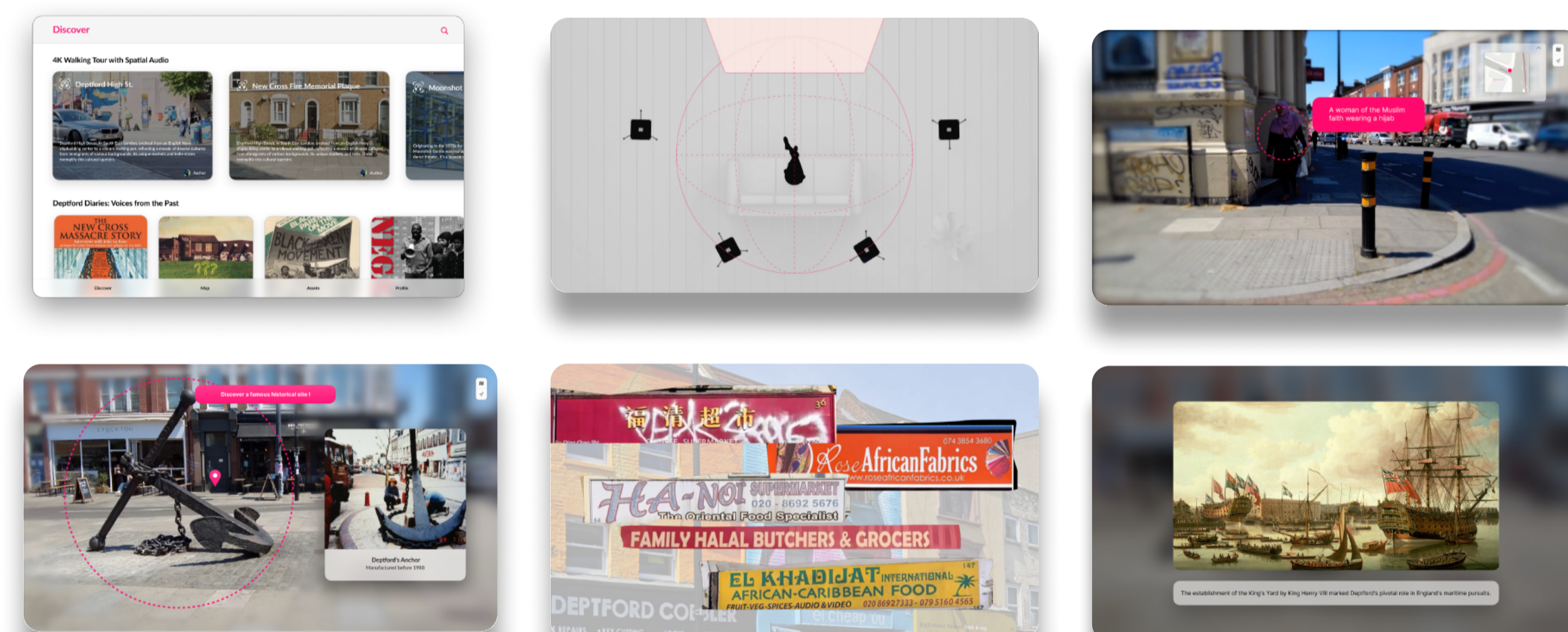
Compatibility: Ensured the product runs stably across multiple platforms and devices.

Diagram / Design

USER FLOW



DESIGN



Test



Research results

- **Visual-Audio Synergy:** Feedback confirms visual enhancements boost audio attention and information transport efficiency.
- **Sound Field Simulation:** 1:1 sound replication isn't essential. Overly realistic sound fields will disturb users' performance and experience. The five prompted audio type is sufficient to build a well-structured spatial audio story.
- **Technical Stability:** Using Unity ensures product reliability in functionality and performance.

Conclusions & Future Work

We've successfully transformed cultural heritage into a panoramic audio-visual product, establishing production standards and utilizing a TV application for content showcase.

Future Prospects:

1. **Content Management:** With growing content, effective organization is crucial, especially as users express interest in self-management.
2. **Map Integration:** Users' interest in map-based storytelling presents an opportunity for a more intuitive experience.
3. **TV Audio Interaction:** We aim to produce more audio interactions on TV platforms.