Star River Notes: Immersive Knowledge Map Space

1. Concept Overview

This project reimagines knowledge management tools as an immersive spatial note-taking system. It replaces traditional linear pages and folders with a visual, navigable 'knowledge universe', where users can explore, organize, and connect ideas in 3D space. By integrating XR spatial awareness with physical input methods, it enables two-way interaction between real and virtual notes.

2. User Tasks & Goals

Task 1 – Build a Spatial Knowledge Graph

- Create, move, and connect note nodes via hand gestures to form a visual network. Node size reflects content volume; colors indicate categories.

Task 2 – Rapid Physical-to-Virtual Capture

- Scan handwritten notes into XR to embed them into relevant topics. Record audio, take photos, or capture screens to instantly import real-world content. Capture highlights from books, whiteboards, or sketches.

Task 3 – Collaboration & Presentation

- Invite others into the shared XR note space for co-editing and discussion. Add comments or sticky notes for collaborative feedback.

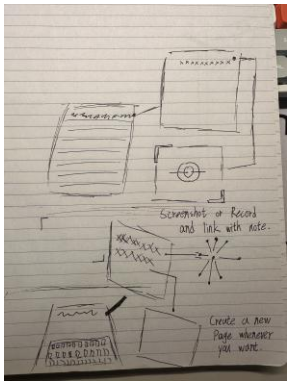

Figure 1 sketch

3. Prototype Development

Initial Idea – Inspired by the Zettelkasten method, visualizing topics as gravity centers with linked sub-nodes.

Week 2 Low-Fidelity Prototype – Used cardboard and sticky notes to simulate XR UI; role-played creating, linking, and deleting nodes.

Refinements – Added 'scan → auto-embed' feature for physical notes, improved linking via 'line-draw + gesture recognition', and introduced a focus mode for large-scale maps.

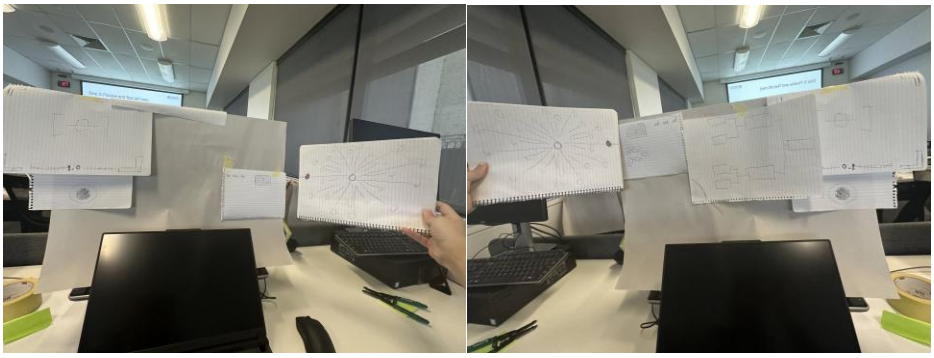

Figure 2 low-fidelity prototype

4. XR Environment & Interaction Design

Scene Design – Notes appear as celestial bodies in a 3D space. Users can zoom, expand, merge, and filter node clusters.

Interaction Methods – Gestures: tap to create, draw to link, hover to mark, double-tap to focus, pinch to zoom. Physical Integration: handwritten notes → scanned into nodes; environmental captures → attached to topics.

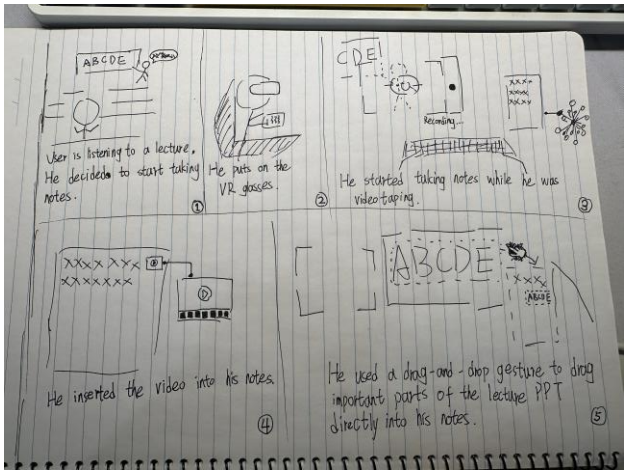

Figure 3 storyboard

5. Initial Testing Plan

Key Features to Test – Intuitiveness of linking and navigation; accuracy of scanned note conversion; effectiveness of spatial organization for comprehension.

Assumptions – Spatial notes improve understanding of complex topics; XR + physical input enhances efficiency and comfort; spatial navigation offers long-term usability benefits.

Data Collection – Behavioral metrics (time, errors, navigation paths); user feedback surveys; comparative testing with 2D note-taking tools.