

De-Risk Plan

1. Motor Control and Smooth Pivoting

- Why it's a risk: The pivoting mechanism requires precise control to create a smooth and consistent movement that mimics the appearance of a rotating orb. Any issues with motor speed, direction, or power could result in jerky or inconsistent motion, disrupting the illusion of rotation.
- Risk Management: Develop and test motor control code early, and ensure motor placement and wiring are optimized within the sphere. Use test setups to verify the motor's behavior before integration with the final assembly.

2. Synchronization of LEDs and Movement

- Why it's a risk: The visual effect of the LEDs needs to be perfectly synchronized with the orb's movement and the fortune-telling process. A lag in LED response or improper timing could diminish the intended dynamic visual experience.
- Risk Management: Prototype the LED synchronization separately and ensure that the timing logic is refined for seamless integration with the orb's movement and fortune display.

3. LCD Screen Integration and Display Quality

- Why it's a risk: The LCD screen must display both the magical graphic and the fortune clearly. There's a risk of misalignment, poor resolution, or electrical issues preventing the smooth transition between the graphic and text display.
- Risk Management: Test the LCD screen independently to ensure proper wiring and code execution. Focus on optimizing graphic quality and ensure that the transition between magical graphics and fortune display is flawless.

4. Power Management for Multiple Components

- Why it's a risk: Managing power for the motor, LEDs, and LCD screen simultaneously could lead to power distribution issues, which might cause components to malfunction or exhibit inconsistent behavior.
- Risk Management: Plan the power system carefully, ensuring all components receive adequate power without overloading the system. Test power consumption during different phases of the orb's operation (e.g., movement, LED effects, fortune display).

5. Space Constraints for Component Placement

- Why it's a risk: Fitting the motor, LCD, LEDs, and wiring inside the orb and base while maintaining enough space for movement and airflow could be challenging. Misjudging space requirements may lead to cramped wiring or overheating.

- Risk Management: Document the dimensions and wiring needs for each component early in the design phase, and create placeholder objects in the CAD model to account for the space each part will occupy.