Activity 6 - Usability Evaluation:

1. Evaluation Goals

Participants wear noise-canceling headphones to remove audio cues. Assess to what degree the participants correctly interpret the visual indicators provided by the prototype and complete tasks. Capture observations of misunderstandings, confusion, and helpful design advice for guidance. The final report will contain tables summarizing the results for task succession rate and direction accuracy.

2. Method Choice & Justification

- **Method**: Task-based usability test with think-aloud.
- **Justification**: Task based testing with think aloud procedures allows detailed qualitative analysis regarding the users understanding of visual indicators. We concentrate on task completion and visual cue interpretation as it helps with design improvements.

3. Participants

6-8 simulated-deaf participants; recruited from the gaming community. Participants are instructed to wear noise canceling headphones that block out in-game sounds, this simulates the experience of deaf and hearing impaired individuals. Participants are mixed genders, with ages ranging from 18 to 35, 3-5 casual gamers with 3 frequent FPS players to ensure that both experienced and novice perspectives are covered.

4. Apparatus

- A personal computer with the prototype running in a modern browser.
- Noise canceling headphones to simulate reduced hearing.
- A quiet room to run the session.
- Overseer to take notes on the results.

5. Tasks & Procedure

Tasks:

1. Identify enemy approaching and the direction they are coming from based on the prototype.

2. Distinguish between explosion and gunshot events based on their respective visual indicators.
3. Pick up when an enemy reloads their gun.
4. Identify visual cue “teammate callout”.

Procedure:

- Welcoming the participants and briefing them on the equipment setup. (5 min).
- short training on what each indicator means (5–10 min).
- Run tasks while the participant thinks aloud (25–30 min).

6. Results

Participant	Task Success (4 tasks)	Mean Direction Accuracy	Mean Interpretation Time	SUS Score
P1	4/4	100%	2.1 s	80
P2	3/4	75%	2.8 s	72
P3	4/4	100%	2.4 s	78
P4	3/4	75%	3.0 s	70

Key observations:

Most mistakes occurred when multiple indicators were being displayed simultaneously; the overlapping visual events caused confusion. Furthermore, participants found the radar useful for coarse direction but asked for better prioritization of events and less clutter when multiple events are happening.

7. Discussion

- **Strengths**:
    - Participants quickly learned the basic mapping between indicators and sounds.
    - Participants could quickly deduce the directions of the indicators thanks to the radar.
- **Issues**:
    - Radar became cluttered in chaotic high event scenarios, reducing clarity.

- Some indicators had colours that conflicted with game elements.

8. Reflection

Participants demonstrated quick learning of the indicators and what they represent, and quickly started deducing indicator directions with the help of the radar. However, during a chaotic situation when a lot of events were taking place, they showed signs of confusion, commenting on the reduced clarity and that some indicator colours conflicted with game elements. To fix these issues, customization settings should be expanded upon, allowing users the ability to customize the indicators themselves while also adding a feature to show only specific types of indicators once indicator count reaches too high (user sets the setting for indicator maximum, while also picking which indicators are considered critical).