CASE STUDY

Game User Research: **First Person In-Game User Experience, Includes Eye Tracking**

KEY LIME INTERACTIVE

Optimize the Experience. Inform Design.

GAME USER RESEARCH:

First Person In-Game User Experience, Includes Eye Tracking

THE FIRST PERSON GAMING EXPERIENCE HAS continued to test our cognitive abilities with better animation, graphics, and speed.

Eyetracking is an incredible tool that has a great deal of potential to measure awareness.

Wolfenstein 3D and Golden Eye were easily replaced by Halo and Call of Duty, making the stimulus and realism of the experience more demanding on player perception and cognition. While games may be more complex today, they all share a similar goal of developing our recognition of specific signals and patterns through training.

The growth of Virtual Reality (VR) and Massively Multiplayer Online First Person Shooter games (MMOFPS) motivated developers to build Modified UIs (MODs) to optimize the Heads Up Display (HUD) and minimize gameplay issues that are directly related to the player's ability to notice and understand in-game cues and objects. These interfaces send numerous complex signals capable of triangulating an enemy's position and distance, peak into your gun to see how many bullets are left, and how many more shots you can take before your armor is gone. Typical usability techniques do not always provide adequate information regarding player awareness and understanding of these elements.

To truly measure the salience of certain signals, Key Lime Interactive (KLI) placed eyetracking goggles on gamers to determine gaze patterns and signal recognition. The objective of the study was to understand when and why some users struggled, and what, if anything, can improve the players perception, cognition, and task success.

Our Solution

Big data is a huge theme today, but there isn't enough focus on analyzing and interpreting all of this data. KLI's engineers drool over projects like this. With the minds of electrical, computer, and industrial engineers working on this project, KLI sought to establish all AOIs (areas of interest) within the gaming environment to observe gaze patterns and dwell time on each of these AOIs. This highly technical task was employed as follows:

Approach

Hybrid—Qualitative & Quantitative

- Fielding Time: 2 days—16 sessions total (8 sessions/day)
- Total N=160: 10 Players/session. 9 remote, 1 in-lab
- Each session will have a remote portal where all 10 players log into a MMFSP.

Quantitative: Unmoderated Survey

- All 160 players will log into the same MMFSP lobby where they will have timed tasks/goals to complete.
- Following each task and the conclusion of the session, players will answer survey questions regarding their experience.
- Nine players will connect to the game remotely from their home and answer an online survey following each task. One will connect in-lab.
- Question Topics
  - Usability
  - Learnability
  - Accessibility
  - Demographics

Qualitative: In-Depth Interview

- All 16 eyetracking sessions will record game audio/video, gaze patterns, dwell time, and webcam audio/video.
- During IDIs, the player will use "think aloud" protocol
- Question Topics
  - Task Analysis
  - Cognitive Task Analysis (CTA)
  - Macrocognition

The Results

By using a hybrid approach combining in-lab IDIs with eye tracking, we were able to develop a holistic strategy to improve the gaming experience and make much more actionable recommendations. For example:

- **Key player types were established that described each type's player practices and preferred rewards.**
  - Refinement to the default set of available characters by prioritizing the distinguishing needs and preferred rewards was recommended.
- **The visual design of the HUD needed a new skin.**
  - Alterations to HUD font (i), style (ii), color (iii), and placement (iv) were recommended based on results of eyetracking gaze data, player needs, and preferences.
- **Task Analysis determined the most difficult in-game task and HUD based task.**
  - UI labels and interactivity needed to modified to fit as many mental models as possible.
- **The accessibility of certain instructions could be improved.**
  - Adding access for closed captions in certain parts of the game as well as being able to initiate any voice command from within the HUD was recommended to improve accessibility for those with language differences.

Conclusion

Making improvements to a game's accessibility and cognition improves the experience for all gamers. It allows more gamers to connect, play, and collaborate towards mutual goals and rewards.

The eye tracking data helped quantify player perception of game components, such as heads-up display elements and specific objects within the 3D world. Running the study with eye tracking provided additional insights into players' gaze and awareness. This enabled game designers to assess the effectiveness of key elements in the 3D world and to optimize the placement and visibility of in-game cues and objects.

What made this unique

Eyetracking is an incredible tool that has a great deal of potential to measure awareness. Using a Hybrid method of Quantitative and Qualitative research allowed us to give more precise recommendations based on specific player types. Having access to gaze patterns and dwell time helps determine if a signal was misunderstood or if it was overlooked.

KLI has appended an internally developed tool that quantifies a user's overall satisfaction.

How else have we used this method

- The combination of Quantitative Research along with Qualitative Insights is a strategy that we use for developing Lean Personas for B2C and B2B.
- Eye tracking was used for many different applications such as:
  - Mobile application testing
  - Email effectiveness
  - Readers fatigue
  - Product placement on shelves in a store
  - Way finding using signage
  - Automotive ethnography
- "Think Aloud" protocol is used in most qualitative IDIs. KLI has appended an internally developed tool that quantifies a user's overall satisfaction. This tool records all changes to satisfaction at any point within the experience by eliminating the need to interrupt or ask repetitive task analysis questions.

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