

1. Introduction

The main purpose of this document is to identify the points at which players become stuck while playing *Cube Escape: Birthday*. The significance of this research lies in reasonably controlling the negative feedback experienced by players during gameplay, thereby preventing players from becoming overly frustrated by insufficient game hints and ultimately leaving negative reviews. In addition, by properly managing the negative feedback, the study aims to maintain players' interest in puzzle games, which benefits the studio when releasing new titles in the future.

2. Research Questions

No.	Questions
1	Can users collect the items necessary to complete the narrative flow?
2	To what extent do items that are unrelated to the game process mislead users?
3	Can users correctly interact with the game scenes?
4	Can users correctly use items to interact with the game scenes?
5	Can users understand the rules of the mini-games within the game?
6	Will users be frightened?

3. Method

3.1 Design

An observation form is used to record item collection, key events, a recording column, and an interview column.

The first two columns record the times when items are collected and when key events are completed. The third column records observed phenomena, with a focus on behaviors such as players talking to themselves, random clicking, repeatedly clicking on a single area, ear reddening, body language, and facial expressions. The fourth column records the players' answers to the interview questions.

3.2 Personas

Participants are selected from individuals aged 20–30 who have never played a puzzle game before.

3.3 Participants

Recruitment will be conducted through social networking platforms, targeting relatives, friends, and classmates.

3.4 Instruments & Measures

Observation form and timer.

3.5 Procedure

3.5.1 Preparation Stage

Debug the equipment and have participants sign a data usage consent form.

3.5.2 Warm-up Stage

Allow users to play *Cube Escape: Harvey's Box* for 20 minutes to become familiar with the controls.

3.5.2 Observation Stage

Have users play *Cube Escape: Birthday*. If the narrative does not advance for 20 consecutive minutes, the gameplay session is terminated; otherwise, the session concludes once the game is completed. During the gameplay, take note of the users' behaviors on the observation form.

3.5.3 Interview Stage

Question 1: Which item in the game was the most difficult to find?

Question 2: Which part of the game confused you? What was your intuition at that moment, and why did you feel it contradicted your intuition?

Question 3: Which part of the game frightened you?

3.6 Data Analysis Plan

3.6.1 Visualization

Create a timeline marking the timestamps for item collection and key events. Additionally, correlate this timeline with the players' interview responses by marking:

1. The time when players found the items they considered the hardest to locate.
2. The approximate locations of items or events that confused them.
3. The times when players were startled.

Also, record the timestamps when players engaged in behaviors such as talking to themselves, random clicking, repeated clicking on one area, experiencing ear reddening, significant body language, or noticeable changes in facial expressions.

3.6.2 Qualitative Analysis

1. Examine the timelines of all players to determine if any patterns emerge, and analyze the reasons behind these patterns.
2. Review the interview records to propose improvements for the hard-to-find items and to analyze the reasons behind players' confusion at certain points. Also, assess if any players were frightened by something that is not designed to frighten players.
3. Compare the interview records with the observed behavioral timestamps to identify any instances where players made physical reactions but did not mention in the interview.