The Great Escape: A 2D School Apocalypse Survival Game

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Abstract— **This paper presents a detailed design document for "The Great Escape," a 2D school apocalypse survival game. Players take on the role of a customizable student trapped within their infected high school, "[School Name]," tasked with escaping and uncovering the outbreak's secrets. The document explores the game's setting, narrative, core mechanics (exploration, resource management, puzzle-solving, combat, character progression, and narrative choices), art style, and design considerations. Inspiration is drawn from existing research on 2D game development, survival mechanics, narrative design, and player psychology.**

Keywords— **2D Survival Game, Narrative-Driven, Exploration, School Environment, puzzle mechanics, resource management.**

I. Introduction

"The Great Escape" is a thrilling video game that combines survival gameplay mechanics with a compelling narrative set in a school overrun by the infected. Players must navigate the eerie halls of the school, carefully managing scarce resources, solving intricate puzzles, and making strategic choices that impact their survival. The game's environment is both familiar and unsettling, heightening the tension and immersing players in a truly terrifying experience. As players progress, they will encounter moral dilemmas that force them to make tough decisions, adding depth to the narrative and shaping the outcome of their escape. "The Great Escape" aims to deliver an innovative and engaging gameplay experience, leveraging the interactive nature of video games to create a truly immersive and unforgettable adventure. This paper explores the design of "The Great Escape," a 2D school apocalypse survival game.

The core focus is on creating a unique and engaging gameplay experience within a familiar yet unsettling environment: a school overrun by the infected.

II. Literature Review

A. School Apocalypse Genre

The School Apocalypse subgenre in video games and other media delves into themes of survival and apocalypse in a school environment, frequently offering an intriguing and distinctive setting for narratives. Taking a lighter approach to a zombie apocalypse within a high school, "High School of the Dead"[1] combines comedy, action, and horror aspects to produce an exciting and engaging experience. The anime shows the characters' resiliency and ingenuity as it examines how kids and instructors work together to survive the pandemic. The zombie hordes in "Left 4 Dead,"[2] on the other hand, emphasize cooperation and strategic survival. The cooperative gameplay features of the game emphasize the value of cooperation and communication in a hazardous world by encouraging players to work together to overcome obstacles. The setting of "The Great Escape," character interactions, and the incorporation of the constant threat of overpowering adversaries were all greatly influenced by these titles.

B. 2D

"The Great Escape" is a game that takes inspiration from successful 2D survival games like "Don't Starve"[3] and "Terraria"[4]. It adapts the core elements of these games to a unique setting: a school environment.

In "The Great Escape", players are thrust into a school setting where they must scavenge for resources, manage their inventory, and craft items to survive. Classrooms, lockers, faculty lounges, and the cafeteria become the hunting grounds for vital resources like food, water, medicine, and crafting materials. The game encourages exploration and

strategic thinking as players must decide what items are essential for their survival.

Inventory management is a crucial aspect of the game. Players are challenged with weight limits, forcing them to prioritize essential items. Lockers scattered throughout the school serve as temporary storage, adding another layer of strategy to the game. The crafting system in "The Great Escape" allows players to combine scavenged materials to create weapons, tools, and medical supplies. This includes sharpened tools and makeshift bats for defence, crowbars for breaking into new areas, and bandages for healing. Overall, "The Great Escape" offers a unique twist on the survival genre, combining elements of resource management, exploration, and crafting in a familiar yet challenging setting.

C. Narratives

"The Great Escape" game skilfully intertwines elements of environmental storytelling and player choice to deliver a rich narrative experience.

Environmental Storytelling[5]: The game uses the environment as a narrative device. Players discover scattered notes and audio logs from survivors, which provide insights into the outbreak's origin and the fate of the school's population. The environment itself tells a story, with details such as abandoned classrooms, barricaded doors, and personal belongings hinting at the chaos and panic that ensued during the outbreak. This form of storytelling immerses players in the game world, making them active participants in uncovering the narrative.

Player Choice: The game also places a strong emphasis on player choice. The narrative unfolds based on the decisions players make throughout the game. For instance, choosing to help a trapped non-player character (NPC) might grant access to hidden supplies, while opting to steal could limit future interactions with other characters. These choices not only impact the direction of the story but also shape the player's character, influencing their reputation among other characters in the game. This element of choice adds depth to the gameplay, making each playthrough unique.

III. Relevance

"The Great Escape" offers a unique take on the survival game genre by placing players in a setting that is both familiar and unsettling: a school. This environment, which is typically associated with learning and growth, is transformed into a landscape of survival, adding a layer of emotional depth to the narrative. The consequences of the player's actions feel more immediate and personal due to this relatable context.

The game offers a diverse gameplay experience by combining elements of exploration, resource management, puzzle-solving, and tactical combat. Players are encouraged to explore their surroundings, manage their resources wisely, solve puzzles to progress, and engage in strategic combat when necessary. This blend of gameplay elements caters to a wide range of player preferences, ensuring that there is something for everyone.

Furthermore, "The Great Escape" places a strong emphasis on player autonomy and narrative decisions. Players have the power to influence the direction of the story through their actions and choices. This not only enhances the replay value of the game but also makes each playthrough a unique experience, as players can explore different narrative paths and outcomes.

IV. Methodology

A. Development

The design of "The Great Escape" is rooted in extensive research into various areas:

2D Game Development Tools: The game leverages Unity, a powerful 2D game development tool. Unity's robust features are utilized for character movement, animation control, physics, and environmental design, providing a solid foundation for the game's development.

Survival Game Mechanics: The game mechanics are inspired by successful survival games. These mechanics, which include resource management, exploration, and combat, are adapted and refined to fit the unique context of the game.

Narrative Design Principles[7]: The game employs narrative design principles to create an engaging and immersive story. The narrative is shaped by player choices, adding depth and replayability to the game.

Player Psychology: Understanding player psychology is crucial to the game's design. The game aims to create a challenging yet rewarding experience that keeps players engaged and motivated. Existing 2D games were studied to understand best practices and identify potential areas for innovation, ensuring "The Great Escape" offers a fresh and exciting experience to players.

B. *Art Style and Design*

Dark and Atmospheric: "The Great Escape" employs a detailed 2D art style that utilizes intricate tilemaps and lighting effects to create a tense and oppressive atmosphere.

Fig1. Starting Menu

The game's visuals are designed to evoke a sense of unease and tension, immersing players in a world that is both familiar and filled with danger.

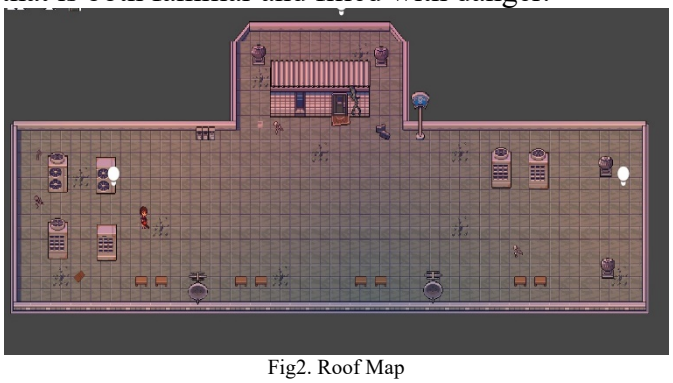

Fig2. Roof Map

Character and Enemy Design: The design of characters and enemies in the game is visually distinct and well-animated. This ensures that movement and actions are conveyed clearly, enhancing the gameplay experience. Each character and enemy sprite is meticulously crafted to be unique, adding depth and variety to the game world.

Fig3. Female Character Design

Sound Design: The game's sound design plays a crucial role in building tension and suspense. A mix of unsettling noises, such as the moaning of zombies and the dripping of water, is interspersed with moments of eerie silence, keeping players on edge and heightening the sense of danger.

V. Mechanics

A. Exploration and Resource Management

Each location offers distinct challenges and opportunities related to exploration, resource management, and puzzle-solving. For example, the science lab might hold valuable medical supplies but also house dangerous hazards.

Procedural generation can be implemented to add replayability by randomizing the distribution of resources and altering puzzle configurations within certain areas

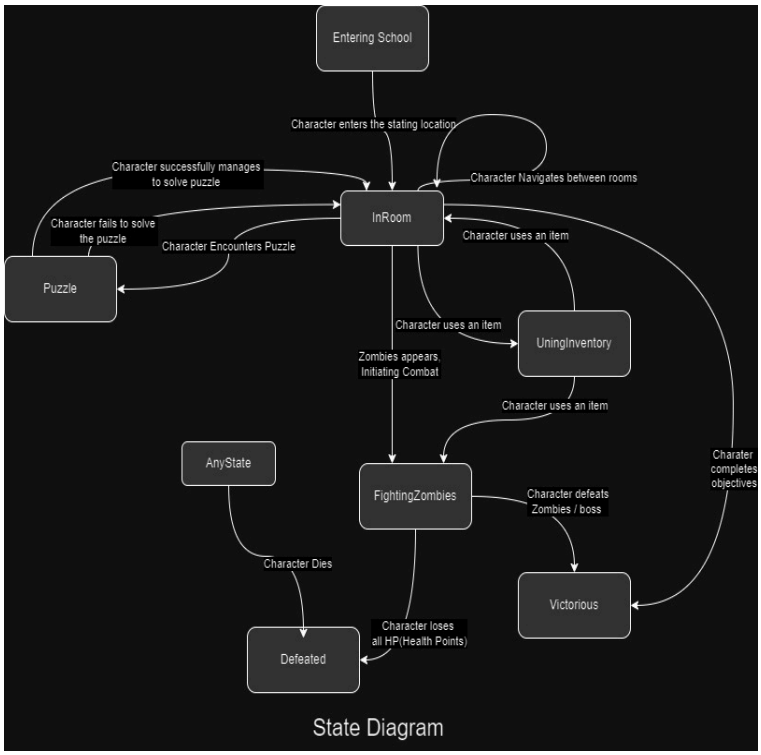

Fig 4. State Diagram of Playable character movement

B. Puzzle-solving

Environmental puzzles are strategically placed throughout the school, requiring players to use their wits and available resources to progress. These puzzles can unlock new areas, reveal hidden caches of supplies, or grant access to crafting stations.

Blockage Puzzles: Desks, overturned furniture, or debris blocking passageways can be cleared with appropriate tools (crowbar) or by solving a secondary puzzle.

Stealth Puzzles: Certain areas might be crawling with infected students. Players use stealth tactics (crouching, hiding) or solve puzzles to bypass them without alerting the horde. These puzzles could involve manipulating the environment (distractions) or activating timed mechanisms to create temporary safe passage.

Wire Puzzles: Colored wires or control panels might block access to specific areas. Players decipher a pattern or solve a logic puzzle to activate the correct wires in the right sequence.

C. Combat

While not the primary focus, players will have to fight off infected students (zombies).

A stamina system depletes with exertion during combat or running. Limited resources (ammo for ranged weapons) make combat a strategic choice, not just button-mashing.

Melee combat involves using crafted weapons or scavenged objects. Melee combat can be contextual and requires timing to land effective blows while conserving stamina.

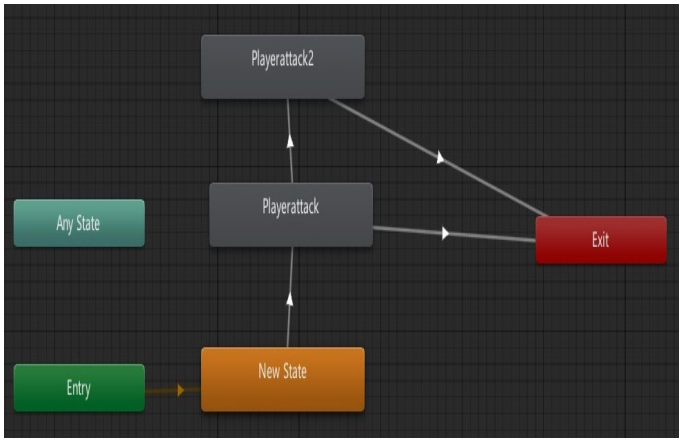

Fig5. Player attack animation controller

Ranged combat incorporates firearms and ammunition. Headshots are one-hit kills against weaker enemies, rewarding precision aiming.

"The Great Escape" utilizes a character controller script for both player movement and animation control. This script, named either "PlayerController" or potentially separate scripts named "Playcontrol" and "Player2Control" depending on your implementation, governs how the player character interacts with the environment.

Here's a breakdown of the core functionalities:

Initialization: During game startup (within the "Start" method), the script establishes references to essential components like the Rigidbody2D (responsible for physics and movement) and Animator (controls character animations).

Movement Control: The script detects keyboard input (using either "Input.GetAxis" for smoother control or "Input.GetKey" for basic on/off control) to translate player movement into in-game actions. Based on the keys pressed, the script sets the velocity of the Rigidbody2D component, propelling the character in the desired direction.

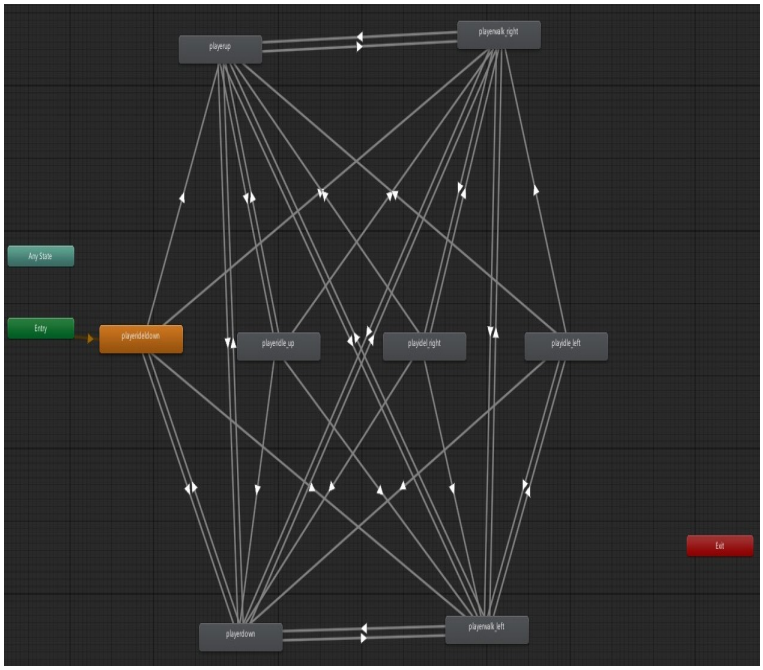

Fig6. Player movement Controller

Animation Control: The script leverages boolean parameters within the Animator component. These parameters are linked to specific animation states (running, idle, jumping) and are triggered based on

the player's movement (e.g., running animation when directional keys are pressed). When the player stops moving, the script triggers the idle animation.

Sprite Flipping (Optional): The script might include logic to flip the character sprite horizontally based on the movement direction. This is typically achieved by modifying the localScale.x value of the game object containing the character sprite.

This approach provides a foundational movement and animation system for the player character, allowing intuitive control within the 2D environment of the school.

VI. Conclusions

"The Great Escape" has the potential to be a thrilling and engaging 2D school apocalypse survival game. The combination of a familiar yet unsettling setting, diverse gameplay mechanics, and player choice offers a unique experience for players. The core mechanics of exploration, resource management, puzzle-solving, strategic combat, and character progression provide a solid foundation for engaging gameplay. The inclusion of procedurally generated puzzles adds a layer of replayability and fosters a sense of a vast and unpredictable environment. Narrative choices woven into the gameplay allow players to shape the story and their character's relationships with other survivors.

The dark and atmospheric art style, combined with carefully crafted sound design, promises to create a tense and immersive experience. By carefully considering all these elements and incorporating feedback through playtesting, "The Great Escape" can become a successful and memorable 2D survival game that stands out within the genre.

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