ELEMENTAL PLANETS

MMI505 PROJECT PHASE - 1

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THE IDEA

- A teleportation-based adventure RPG where the main character, a scientist from Earth, travels to four elemental planets (Earth, Water, Fire, Air) to learn elemental bending skills. The goal is to gather knowledge, uncover clues, and defeat powerful bosses across different planets.

THE CONCEPT

- The concept of elemental bending in Elemental Planets is inspired by the popular series Avatar: The Last Airbender [7]. Like in the series, each planet allows our main character to master a unique element, which plays a crucial role in both combat and puzzle-solving.

Figure 1: The four elements

LITERATURE SURVEY ON CURRENT RELATED GAMES:

- Hades (2020): Known for its roguelike structure and procedurally generated dungeons, Hades [10] provides players with varied experiences each run. The game's combination of unique power-ups and enemy adaptation influenced the structure of Elemental Planets' multi-planet setup and adaptive enemy mechanics [11].

- Legend of Zelda Series (multiple releases): The Legend of Zelda [8] series inspires the puzzle elements in Elemental Planets, especially the way players use acquired abilities to unlock new areas and solve environment-based puzzles [9]. This concept is applied in Elemental Planets as players acquire new elemental skills on each planet to unlock different areas.

ACADEMIC RESEARCH ON PROCEDURAL GENERATION AND ADAPTIVE GAMEPLAY:

- **Procedural Content Generation (PCG):**
  Elemental Planets utilizes procedural generation to create varied, dynamic environments across its elemental worlds. Each planet maintains a consistent layout but features unique elemental attributes—such as gravity on the Air planet or heat intensity on the Fire planet—that enhance replayability and player immersion. This approach aligns with techniques outlined in procedural content generation studies, which emphasize creating diverse, algorithmically generated worlds for improved replayability [1], [2].

- **Adaptive Gameplay and AI:**
  The game incorporates adaptive AI that adjusts enemy tactics based on the player's actions and elemental skills, providing a tailored challenge. By dynamically responding to the player's choices, the AI helps maintain an engaging level of difficulty, consistent with research that supports adaptive gameplay to heighten player engagement [2], [3]. This dynamic adjustment encourages strategic use of skills and the teleportation mechanic. Such player modeling techniques are critical for maintaining gameplay difficulty, as discussed in studies on adaptive AI in games [5].

PUZZLE DESIGN WITH PROCEDURAL GENERATION

- **Procedural Puzzle Generation:**
  Elemental Planets uses procedural generation to create diverse, element-based puzzles that adapt to each planet's unique environment. The varied gravity and elemental themes introduce different types of interactions, with water-based puzzles involving fluid dynamics and earth-based puzzles focusing on solid obstacles. This approach is aligned with procedural puzzle generation techniques discussed in academic research [4].

- **Mechanics-Dynamics-Aesthetics (MDA) Framework:**
  The MDA framework guides how bending abilities in *Elemental Planets* function as both combat tools and puzzle-solving mechanics, providing players with an engaging experience. Each element introduces unique dynamics, challenging players to think strategically in different contexts. This design approach emphasizes the impact of game mechanics on player engagement [5].

LIMITATIONS OF CURRENT GAMES AND RESEARCH APPLICATIONS

- **Procedural Content Constraints:** Many procedural generation algorithms create randomness without context, sometimes resulting in repetitive or disjointed environments. *Elemental Planets* addresses this by tailoring each planet's environment to its elemental theme, making procedural layouts feel purposeful and thematically consistent.

- **Adaptive AI Complexity:** While adaptive AI is promising, achieving balance without frustrating players remains challenging. *Elemental Planets* uses adaptive AI in controlled encounters, especially in boss fights, allowing players to strategize while facing AI that learns from their actions.

CHARACTERS

Main Character:

- Name: Dr. Bumi Wan

- Background: Dr. Wan is an earth-bender and an accomplished scientist living on Earth. Fascinated by the legends of elemental powers, he has devoted his life to studying the ancient secrets of his world and its neighboring planets.

- Personal Motivation: After losing his family in a catastrophic event linked to mysterious elemental disturbances, Dr. Wan seeks to understand these elemental forces to prevent further devastation. His research suggests that the balance between the elements has been disrupted, putting all planets at risk of collapse.

Figure 2: Dr. Bumi Wan created by ChatGPT 4o

JOURNEY ACROSS ELEMENTAL PLANETS:

Earth Planet (Starting Point)

- **Features:** Dense forests, rocky landscapes, strong gravity.

- **Disturbances:** Earthquakes and shifting landscapes hint at a larger imbalance.

- **Skill Gained:** Enhanced earth-bending for creating barriers and manipulating terrain.

Water Planet

- **Features:** Floating islands, rivers, serene yet turbulent waters.

- **Disturbances:** Tides and droughts signal a destabilized water element.

- **Skill Gained:** Water-bending, allowing control over water currents and healing.

Figure 3: Water planet puzzle level created by ChatGPT 4o

JOURNEY ACROSS ELEMENTAL PLANETS:

Fire Planet

- **Features:** Volcanic landscapes, intense heat, rivers of lava.

- **Disturbances:** Frequent eruptions show the imbalance's toll.

- **Skill Gained:** Fire-bending, enabling Dr. Wan to melt barriers and create bursts of light.

Air Planet

- **Features:** Floating rocks, low gravity, thin atmosphere.

- **Disturbances:** Residents struggle with diminishing wind control.

- **Skill Gained:** Air-bending, granting agility and the power to manipulate wind.

Figure 4: Fire planet puzzle level created by ChatGPT 4o

FINAL REVELATION & LEGACY:

- **Discovery:** Dr. Wan realizes that the imbalance stems from a fractured connection between the elements, caused by an ancient conflict. Only by uniting the elements can he prevent a planetary collapse.

- **Confrontation:** Armed with all four elemental skills, he faces a powerful force born from the imbalance. This final battle tests his mastery over the elements and his commitment to restoring harmony.

- **Outcome:** Dr. Wan successfully reunites the elements, stabilizing the planets and restoring peace. His journey honors his family's legacy and safeguards the elemental worlds.

- **Legacy:** With balance restored, Dr. Wan returns home, having achieved his mission to protect his world and honor the memory of those he lost.

GAME OVERIVEW

- **Game Genre:** RPG + Puzzles

- **Target Platform:** PC (to be developed with Unity)

- **Target Audience:** Players aged 16 and above who enjoy strategic RPGs, fantasy worlds, and puzzle-based exploration.

- **Number of Players:** Singleplayer

- **Game World:** A multi-planet setting with distinct elemental worlds (Earth, Water, Fire, Air), each with unique physical conditions and environmental challenges. Each planet has a consistent layout but varies in gravity, temperature, and atmosphere, creating diverse gameplay experiences.

Figure 5: The game world planets created by ChatGPT 4o

STORYBOARD

Figure 6: The generel level overview created by ChatGPT 4o

- **Elemental Zones:** The level features distinct areas for each element—Earth, Water, Fire, and Air. Each zone has unique environmental features and challenges, requiring players to strategically use the corresponding elemental abilities.

- **Player HUD and Skills:** The bottom of the screen displays the player's elemental abilities (Earth, Water, Fire, Air) along with cooldown indicators, allowing players to track and plan their skills effectively. A teleportation cooldown is also shown, emphasizing the importance of timing and strategy.

STORYBOARD

- **Dialogue with NPCs:** The game features interactive dialogues where NPCs provide valuable hints, lore, and guidance, helping players progress through the main storyline.

- **Journal Entries:** Dr. Bumi Wan keeps a detailed journal, automatically updating with discovered clues, lore, and essential hints. This allows players to track story progress, revisit important details, and piece together the mystery of the elemental imbalance.

- **Environmental Hints:** Subtle symbols, mystical patterns, and hidden markers in the environment guide players, enriching the atmosphere and encouraging exploration. These elements serve as breadcrumbs, leading players toward objectives and enhancing the immersive experience.

Figure 7: The dialogue screen created by ChatGPT 4o

STORYBOARD

- **Adaptive Environment:** Players can teleport between planets with similar layouts but different elemental conditions. This allows dynamic gameplay as players leverage environmental advantages based on the current zone's element.

- **Enemies and Interactions:** Each elemental zone includes enemies that respond uniquely to the player's elemental skills. For example, water creatures are vulnerable to fire abilities, and air-based enemies may be slowed down in the earth zone, encouraging players to adapt to each environment.

Figure 8: A main boss illustration created by ChatGPT 4o

GAME COMPONENTS

Story Completion Journal:

- Tracks clues and pieces of lore gathered from each planet, helping players piece together the storyline as they progress.

- Acts as a guide, allowing players to revisit past discoveries and stay engaged with the main story.

Planet-Specific Physics and Conditions:

- Each planet has unique physical conditions that affect gameplay, such as varying gravity on the Air planet or high temperatures on the Fire planet.

- Level layouts are consistent across planets, but the environmental conditions and elemental interactions change based on the planet, adding variety to exploration and combat.

Figure 9: The journal created by ChatGPT 4o

GAME COMPONENTS

Crystal Save Mechanic:

- Crystals scattered across the planets allow players to save their progress.

- Save points also act as checkpoints, restoring health or providing buffs, encouraging strategic planning around exploration and battles.

AI-Driven Enemies:

- Enemies are controlled by adaptive AI, responding to the player's actions and elemental abilities.

- Each planet's enemies have unique behaviors influenced by the local element, requiring players to adapt their strategies.

Figure 10: The saving crystal created by ChatGPT 4o

GAME COMPONENTS

Inventory Management:

- Players collect items from defeated enemies and bosses, including potions, weapons, and elemental enhancements.

- Inventory management allows players to strategize their use of items, especially in challenging environments or against specific elemental bosses.

Skill and Teleportation Cooldowns:

- Elemental skills and teleportation have cooldowns, adding a strategic layer to combat and exploration.

- Players must carefully time their teleportation and elemental abilities, especially when facing enemies with complementary or opposing elemental skills.

Figure 11: Sample inventory image created by ChatGPT 4o

CONCLUSION

- *Elemental Planets* combines RPG and puzzle-solving mechanics with a unique elemental bending system.

- Each planet offers distinct environments, abilities, and challenges, ensuring dynamic and engaging gameplay.

- Procedural generation and adaptive AI enhance replayability and create a responsive, personalized experience.

- Dr. Bumi Wan's journey adds depth, connecting players to an immersive story of elemental harmony and adventure.

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