FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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WORKSHOP II (BITU 3923)
BITE

PROJECT TITLE :

LUCY: INNER WORLD

PRODUCTION TEAM:

ST4R STUDIO

PREPARED BY :
GROUP NUMBER : 4

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CHAPTER I

INTRODUCTION

1.1 Introduction

This project introduces *Lucy: Inner World* seeks to bridge this gap by creating an interactive experience that immerses players in the emotions of Happiness, Anger, and Fear. By engaging with these emotions through gameplay, players can gain a deeper understanding of their own feelings and reactions, making the game both entertaining and thought-provoking. It offers a unique way to reflect on emotions in a safe and controlled environment. Through its carefully designed mechanics and storytelling, the game encourages self-awareness and emotional regulation. This experience appeals not only to casual gamers but also to those with an interest in psychology, as it provides an opportunity to explore emotions in an interactive and engaging way.

In *Lucy: Inner World,* it consists of three distinct levels, each representing a different emotion. The *Happiness* level is designed with bright visuals, uplifting music, and rewarding mechanics to create a joyful and motivating experience. The *Anger* level contrasts this with an intense, fast-paced environment featuring a lava floor, fiery obstacles, and challenging gameplay that reflects frustration and rage. Lastly, the *Fear* level immerses players in an eerie atmosphere with dark aesthetics and limited visibility, heightening the sense of suspense and anxiety. The game incorporates essential features such as collision detection, AI-enemy, audio, asset management, and a user-friendly GUI to enhance the immersive experience.

Ultimately, *Lucy: Inner World* delivers a compelling emotional journey through interactive gameplay. By combining mechanics, storytelling, and visual design, it creates an experience that resonates with players on a deeper level. Through this innovative approach, *Lucy: Inner World* stands out as a meaningful exploration of human emotions in the realm of gaming.

1.2 Background / Market Survey

Background of the Product

Lucy: Inner World is an emotion-driven game that explores Happiness, Anger, and Fear through interactive gameplay which every level exhibits a different atmosphere and mechanics. It aims to provide players with an immersive experience that reflects real emotional states through unique mechanics and visuals.

Similar Existing Products

- Inside Out
- Little Nightmares
- Detroit: Become Human

Current Market Landscape

- **Malaysia**: Growing interest in indie games, psychological storytelling, and emotional narratives. Increasing government support for local game development.
- **Internationally**: Strong demand for narrative-driven indie games with emotional depth (e.g., *Celeste, Gris*). Players seek meaningful gaming experiences beyond traditional action or adventure genres.

1.3 Project Objective

The primary objectives of this project are:

- **Develop an Emotion-Based Game Experience:** Create a game that represents *Happiness, Anger,* and *Fear* through unique gameplay mechanics and visuals.
- **Integrate AI for Adaptive Gameplay:** Implement AI-driven mechanics to adjust difficulty, control NPC behavior, and enhance immersion.
- **Provide an Engaging Narrative and Atmosphere:** Use storytelling, sound design, and environmental elements to immerse players in each emotional state.

1.4 Scope

Target Users

- **Casual Gamers** – Players who enjoy immersive storytelling and unique gameplay experiences.
- **Psychology & Mental Health Enthusiasts** – Individuals interested in emotional awareness and psychological themes in gaming.
- **Indie Game Fans** – Players who appreciate artistic, narrative-driven games
- **Students & Researchers** – Those studying game design, psychology, or interactive storytelling.

Scope & Limitations

Scope

- This product features three emotion-based levels which are Happiness, Anger, and Fear, each with unique mechanics and visuals.
- *Lucy: Inner World* delivers an immersive experience by integrating emotional storytelling through gameplay, sound, and design.
- Basic AI and physics are implemented to enhance interactions and challenges in *Lucy: Inner World*.
- GUI integration ensures smooth navigation and efficient gameplay management in *Lucy: Inner World*.

Limitations

- The game features a limited level count, with three levels, each representing a single emotion.
- The game is restricted for single-player only, with no multiplayer or cooperative gameplay modes.
- The game follows a structured level-based format and does not feature open-world exploration.

1.5 Theme Selection

The main character in Lucy: Inner World is a robot named Lucy, who embarks on a journey to discover her emotions. Throughout the game, players guide her through various emotional states, each represented by different levels.

To enhance emotional engagement and gameplay dynamics, the game incorporates AI-driven elements. AI is used to control enemy behavior, environmental interactions, and the adaptive difficulty system, ensuring that each emotion is reflected accurately. These elements make the game experience more immersive, as the AI adjusts to Lucy's emotional journey, offering a unique challenge and narrative progression in each level.

1.6 Concept or Genre

1. **Concept & Planning (Week 1)**
    - Define the game idea, core mechanics, and emotional themes.
    - Research similar games and market trends.
    - Set up development tools and create a project timeline.

2. **Pre-Production (Week 2)**
    - Develop initial game design documents.
    - Create storyboards and sketches for characters and environments.
    - Plan AI behavior and technical requirements.

3. **Prototype Development (Week 3-4)**
    - Build a basic playable prototype with placeholder assets.
    - Implement core mechanics (movement, physics, basic AI).
    - Test level transitions and UI functionality.
        i.
4. **Asset Creation & Level Design (Week 5-7)**
    - Develop final 3D assets, animations, and sound effects.
    - Design and structure levels for *Happiness, Anger, Fear*.

- Optimize lighting, textures, and effects for emotional impact.

5. **AI & Gameplay Mechanics (Week 8-10)**
    - Implement AI-driven interactions, enemy behaviors, and adaptive difficulty.
    - Add dynamic environmental elements that react to player actions.
    - Enhance player feedback mechanisms (visual, audio, haptic).

6. **Testing & Debugging (Week 11-13)**
    - Conduct internal and external playtesting.
    - Identify and fix bugs, glitches, and performance issues.
    - Optimize AI behaviors and refine gameplay balance.

7. **Finalization & Optimization (Week 14)**
    - Apply final performance optimizations for smooth gameplay.
    - Polish UI, sound design, and graphical elements.
    - Ensure compatibility across different hardware.

8. **Launch & Documentation**
    - Prepare the game for release, create promotional materials.
    - Write the final report and project documentation.
    - Showcase the game.

1.7 Conclusion

The development of *Lucy: Inner World* successfully explores the integration of AI-driven gameplay with an emotion-based narrative, offering players an immersive experience that reflects the emotional themes of Happiness, Anger, and Fear. Through its innovative design, the game enables players to engage with these emotions in a meaningful way, enhancing both the story and the gameplay.

Designed for casual players, psychology enthusiasts, and indie game fans, *Lucy: Inner World* aligns with current gaming trends both in Malaysia and internationally. Drawing inspiration from games like *Detroit: Become Human* and *Little Nightmares* and movies like *Inside Out*, the game stands out by using AI to dynamically adjust gameplay based on the emotional themes. This approach not only adds depth to the player's experience but also offers a fresh take on how AI can be used to tell emotionally driven stories.

CHAPTER II

PROJECT DEVELOPMENT PHASES

2.1 Introduction

This section outlines the development phases used in the project, from conceptualization to the final implementation. Each phase plays a crucial role in ensuring a smooth and efficient workflow, following a structured timeline. The phases include planning, prototyping, asset creation, AI integration, testing, and optimization.

2.2 Task Distribution and Organizational Chart

In the development of *Lucy: Inner World,* there are four roles responsible and contributing to develop the game. Table 2.2 shows the team members and their assigned roles:

NAME	ROLES	TASKS
AHMAD FAIZ SYURAIHAN BIN AHMAD	Game Designer	Develops game mechanics, level design, and overall user experience.
MUHAMMAD FARIS MIFZAL BIN AZMAN	Programmer	Implement game mechanics, physics, and UI integration using Unreal Engine.
NUR IYLIA SYAZWANI BINTI ABD. RAHMAN	Game Artist	Design character assets, animations, and environmental assets.
FARAH ALYA SYAHIRAH BINTI BOKORI	UI/UX Designer	Designs and implements intuitive user interfaces for seamless navigation and interaction.

Table 2.2: Roles and Task Distribution

2.3 Development Phases / Pipeline

1. **Concept & Planning** – Define the game idea, research existing games, and outline core mechanics.
2. **Pre-Production** – Develop initial game design documents, create storyboards, and define technical requirements.
3. **Prototype Development** – Implement core mechanics, develop basic AI behavior, and test early gameplay functionality.
4. **Asset Creation & Level Design** – Design game environments, create animations, and develop the levels for *Happiness, Anger, and Fear*.
5. **AI & Gameplay Implementation** – Integrate AI-driven mechanics, adaptive difficulty, and interactive NPCs.
6. **Testing & Debugging** – Conduct playtesting, fix bugs, and optimize game mechanics based on feedback.
7. **Finalization & Optimization** – Polish UI, refine AI behavior, and optimize performance.
8. **Launch & Documentation** – Prepare promotional materials, finalize documentation, and showcase the game.

2.4 Project Planning

The project timeline is decided and divided by weeks as it shown below:

- **Weeks 1-2:** Concept & Planning – Define objectives, research, and team coordination.
- **Weeks 3-4:** Pre-Production – Develop documentation, initial designs, and technical planning.
- **Weeks 5-7:** Prototype Development – Implement core mechanics and AI framework.
- **Weeks 8-10:** Asset Creation & Level Design – Develop environments, animations, and sound effects.
- **Weeks 11-13:** Testing & Debugging – Playtesting, bug fixes, and performance optimization.
- **Week 14:** Finalization & Optimization – Final tweaks and improvements before launch.
- **Post-Week 14:** Showcase & Documentation – Game release and final project documentation.

2.5 Summary

The development of *Lucy: Inner World* follows a structured and organized process, ensuring smooth execution from concept to completion. Each phase, from planning to launch, is carefully mapped out to maintain efficiency and quality. The team members contribute in specialized roles, working collaboratively to bring the game to life.

CHAPTER III

ANALYSIS OF GAME NEEDS

3.1 Introduction

This section outlines the software, hardware, and user requirements essential for developing *Lucy: Inner World*. The project requires specific tools for game development, asset creation, and project management to ensure smooth execution.

3.2 Analyze Software and Hardware Requirements

Table 3.2.1 shows software requirements and its function.

SOFTWARE	**FUNCTIONS**
Unreal Engine	Game engine used for creating level design, rendering, physics, and game mechanics.
Diversion Control	Version control allows team members for collaboration and code management.
Blender	3D software used for editing 3D models for characters in games.

Table 3.2.1: Software Requirements

Table 3.2.2 shows hardware requirements and its function.

HARDWARE	**FUNCTIONS**
PC/Laptop	Workspace used in developing the game.
Keyboard & Mouse	Mechanical keyboard and precision gaming mouse for efficient development.
Controller	Xbox Series Controller / PlayStation DualSense

	used for gameplay testing
Headset	Headphone or earphone used to test sound effects and background music in game.
External Storage	External hard drive stores large files and backup files of the game.

Table 3.2.2: Hardware Requirements

3.3 Gameplay

Concept Overview

Lucy: Inner World is a narrative-driven side-scroller platformer where the player navigates through three levels representing different emotions: Happiness, Anger, and Fear. The goal is to explore Lucy's subconscious and overcome emotional challenges.

1. **Player Interaction & Control**

- **Movement**: Players can move using **WASD, C** and spacebar keys (keyboard input) or analog stick (controller input).
- **Drag and Push Mechanics:** Players allow to drag by holding left click on mouse or RB on controller and push objects by moving towards moveable objects such as box and wooden block.
- **Interactive objects:** Players can interact with certain objects such as lights by **E** keys.

2. **Differences Between Levels**

- **Happiness Level**: Bright and uplifting environment, collecting alphabet puzzles and exploration.
- **Anger Level**: Lava floors, fast-paced obstacles, collecting heart puzzles and fire traps representing inner rage.
- **Fear Leve**l: Dark environment, lights puzzle, and eerie AI-driven enemies.

3. Win/Loss Conditions

- **Winning Condition**: The player must complete all objectives, and solve all the puzzles and reach the level's endpoint.
- **Losing Condition**: Failing objectives, falling into hazards, or being caught by enemies (depending on the level).

3.4 Game Mechanics

Core Mechanics & Rules

- **Platforming:** Players must jump, climb, and avoid obstacles.
- **Puzzle-solving:** Some levels require solving interactive puzzles.
- **AI Interactions:** AI-driven entities react dynamically to the player's actions.

Types of Interactions

- **Player-Environment:** Objects can be pushed, climbed, or activated.
- **Player-Enemies:** AI enemies have different behaviors based on the level's theme (e.g., chasing in Anger, hiding in Fear).
- **Player-NPCs:** Interactive elements guide the player through the game.

AI Behavior & Object Interactions

- **Enemy AI:** Adaptive difficulty based on the player's progress.
- **Environmental Changes:** Dynamic events triggered by player actions.

3.5 Summary

The analysis of Lucy: Inner World highlights the essential software and hardware requirements, structured gameplay mechanics, and engaging AI interactions that contribute to an immersive gaming experience. Each level is designed to provide unique challenges that require different strategies, ensuring an engaging journey for the player.

CHAPTER IV

GAME DESIGN

4.1 Introduction

Game design is the process of conceptualizing, planning, and structuring a computer game to create an engaging user experience. This involves defining gameplay mechanics, storylines, assets, and system architecture to ensure smooth and immersive interactions for players. Lucy: Inner World is designed as an emotional narrative platformer with unique gameplay elements that reflect different emotional states.

4.2 Media Collection / Game Assets / SFX / Scripts

The development of Lucy: Inner World includes various types of media assets:

1. **Text**:
    - Dialogue scripts.
    - In-game instructions.
    - UI text

2. **Graphics**:
    - Character sprites
    - Environment textures
    - UI elements

3. **Audio**:
    - Background music
    - Sound effects (SFX)
    - Voice lines

4. **Video**:
    - Cutscenes
    - Animated sequences

5. **Animation**:
    - Character movements such as walking, dash and crouch

4.3 System architecture

The system architecture of *Lucy: Inner World* is designed with multiple layers to ensure smooth gameplay, efficient performance, and immersive interactions.

1. **User Interface (UI) Layer** – Handles menus, HUD, and player interactions for navigation and gameplay.
2. **Game Logic Layer** – Manages player movement, level progression, and scripted events.
3. **Rendering Engine Layer** – Uses Unreal Engine for real-time 3D graphics, lighting, and effects.
4. **Physics & AI Layer** – Implements object physics, player interactions, and AI-driven enemies/NPCs.
5. **Audio Processing Layer** – Controls background music, sound effects, and voiceovers for immersion.
6. **Storage & Data Layer** – Saves player progress, loads game assets, and manages performance.

4.4 Game flowboard

Diagram 4.4 shows the flowboard for *Lucy: Inner World*.

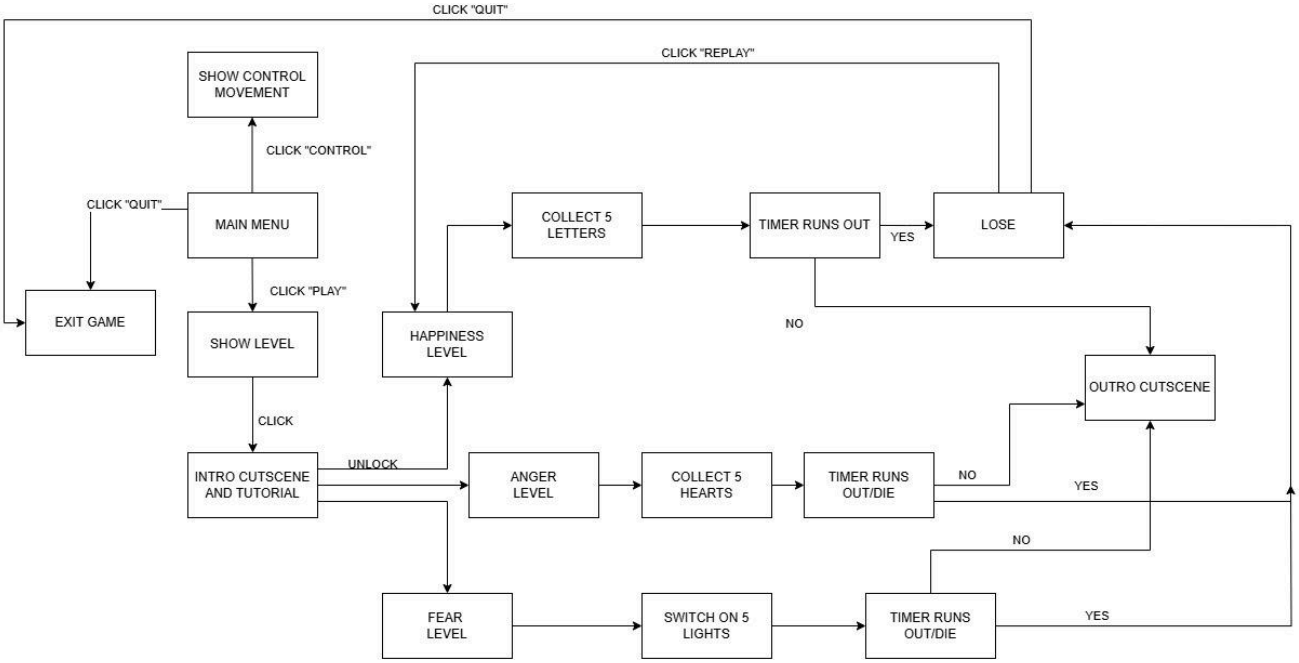

Diagram 4.4: Game Flowboard

4.5 In-game User Interface

Diagram 4.5 shows user interface from *Lucy: Inner World*.

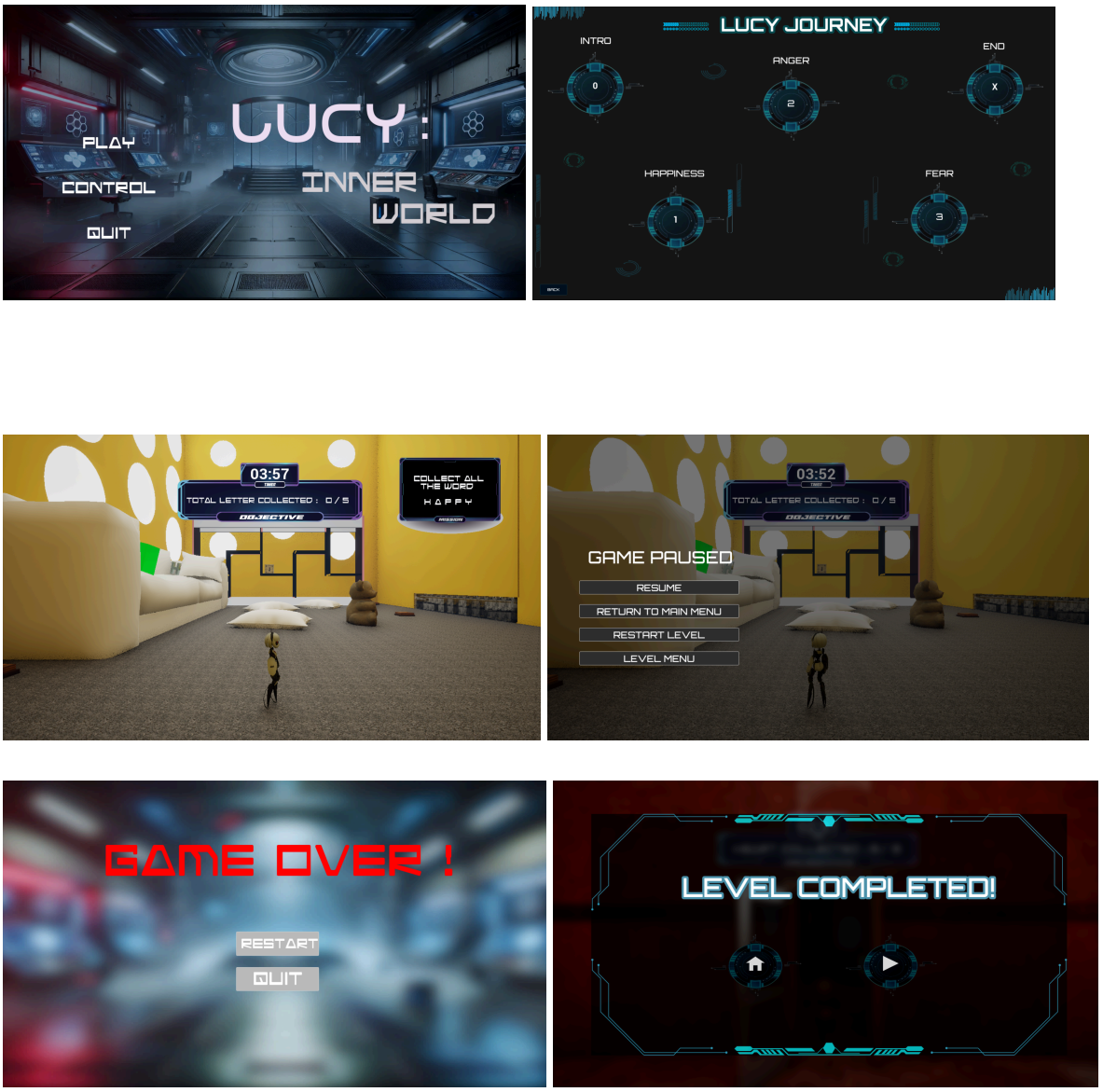

Diagram 4.5: User Interface in Lucy: Inner World

4.6 Input/Output

Input specifications

1. Keyboard and mouse input
    - **Keyboard**: **WASD** for movement, **E** for interaction, spacebar for jump and **C** for crouch.
    - **Mouse**: Left click for grab items, right click for dash.

2. Controller input
    - Left Joystick: Movement
    - **A keys: Jump**
    - **X keys:** Interact objects
    - **B keys:** Crouch
    - **R2/RT button:** Grab
    - **R1/RB button:** Dash

Output specifications

1. **Pause menu**
    - Font type : Orbiton
    - Size : 24

2. **Main Menu**
    - font type : android 7 and android nation
    - size : 180 and 70

3. **Pop-up message**
    - Font type : android nation
    - Font size : 20

4.7 Summary

The key aspects of *Lucy: Inner World* in game design includes its gameplay structure, media assets, system architecture, user interface, and input/output specifications. The game is designed as an emotion-driven platformer, integrating various media elements such as text, graphics, audio, and animations to enhance the player experience.

The system architecture consists of multiple layers, ensuring smooth performance through structured UI, game logic, rendering, physics, AI, audio processing, and data management. The flowboard and user interface designs define the game's navigation and interaction methods, providing a seamless gameplay experience.

Additionally, the chapter detailed the input/output specifications, outlining control schemes for both keyboard/mouse and controllers, as well as the typography and layout used in menus and pop-up messages.

CHAPTER V

GAME IMPLEMENTATION AND DEPLOYMENT

5.1 Introduction

The implementation process is crucial for turning ideas into a functional game. It ensures the game works smoothly and provides an enjoyable experience for players.

5.2 Production and Implementation

The development of our game is progressing well, with the team working efficiently and in sync. Each member is actively contributing to the different stages of the game's creation, from design to coding. We're maintaining a balanced pace, ensuring that every aspect is thoroughly developed and tested. This collaborative experience has allowed us to strengthen our skills, and the process has been both productive and enjoyable as we work towards completing the game.

5.2.1 Text Production

Table 5.1 outlines the text production process for *Lucy: Inner World*. This includes designing and implementing text elements that players see in the game's user interface and promotional materials. The text was designed to be visually appealing, consistent, and easy to read, enhancing both the gameplay experience and the game's presentation.

Text Production	Description
Orbiton	Used for in-game UI text.
Android-7	Applied for in-game instructions and text.
Android-nation	Used in some of the in-game UI elements for variation.
Ethnocenric, Arial Rounded MT, Montserrat Bold.	Used for creating and editing the posters.

Table 5.1 : Text Production

5.2.2 Graphic Production

Table 5.2 shows the graphic production for Lucy: Inner World, where we focus on creating the visual elements like characters and backgrounds. Using Unreal Engine, we can design the game's world and interface with clear, high-quality graphics. The goal is to make everything visually appealing and match the game's theme.

Graphic Production	Description
Unreal Engine	Used to create game world and interface with high quality graphic

Table 5.2 : Graphic Production

5.2.3 Audio Production

Table 5.3 outlines the audio production for Lucy: Inner World. We use YouTube to find music references and gather ideas for the game's sound. This process includes choosing the right music and sound effects to match the game's atmosphere and improve the player's experience. The aim is to create a distinctive audio environment that enhances the overall gameplay.

Audio Production	Description
YouTube	Used to find music references and inspiration for the game's soundtrack.

Table 5.3 : Audio Production

5.2.4 Video Production

Table 5.4 explains the video production process for Lucy: Inner World. This is where we create and edit the visual content that players will see throughout the game. Our focus is on producing videos that align with the game's theme and are engaging for players. By carefully crafting these visuals, we aim to enrich the gaming experience and build an immersive world.

Video Production	Description
Adobe After Effects	Used for creating and editing the game trailer and gameplay videos.

Table 5.4 : Video Production

5.2.5 Animation Production

Table 5.5 shows how animations are created for Lucy: Inner World. We use Unreal Engine and Mixamo to bring characters and scenes to life. These animations add movement and excitement to the game, enhancing the overall player experience.

Animation Production	Description
Unreal Engine	Used to adjust the rotation, size, and movement of assets in the game world
Mixamo	Used to create animations for characters.

Table 5.5 : Animation Production

5.3 Integration Production

Table 5.6 describes how all components are combined in Lucy: Inner World. This process involves integrating graphics, animations, and sound to build a complete and polished game. By blending these elements effectively, we ensure the game delivers a cohesive and enjoyable experience for players.

Integration Process	Description
3D Assets	Free models, such as characters and objects, were imported from Sketchfab.
Sound Effects	Free royalty-free sound effects were obtained from Pixabay.
Programming	Game functionality was developed and implemented in Unreal Engine.
Graphic User Interface	GUI assets were sourced from Freepik and incorporated into the game.

Table 5.6 : Integration Production

5.4 Summary

Following the implementation process is essential for improving the game development workflow. Proper execution of this process ensures smoother progress and increases efficiency. Successfully integrating all components results in a functional and polished game, making the development journey more organized and rewarding for the team.

CHAPTER VI

POST PRODUCTION/PROMOTION

6.1 Introduction

The game prototype is now ready for playtesting, allowing the audience to evaluate its mechanics and overall performance. Feedback collected from the audience will be used to make improvements and enhance the game's quality.

6.2 Computer Game Testing (Production Quality)

Before finalizing *Lucy : Inner World*, our team did a round of testing to make sure everything was working properly. Each of us played through the game to check that all features and mechanics were functioning as they should. We looked for any bugs or issues that could affect the experience and worked together to fix them.

6.3 Online Product Promotion

YouTube serves as an ideal platform for promoting Lucy: Inner World by showcasing the game trailer and gameplay videos. The videos are uploaded in MP4 format to ensure high-quality visuals with a manageable file size. To increase reach, the video links are shared with friends and family, encouraging them to spread the word about the game as part of the promotion strategy. Table 6.1 lists all the promotion videos on Youtube.

Title	Link
Lucy : Inner World (Trailer)	GROUP 4 LUCY INNER WORLD
Lucy : Inner World (Gameplay)	GAMEPLAY LUCY : INNER WO…

Table 6.1 : Link Youtube of Promotion

6.4 Poster

For the poster, we designed it based on our game Lucy: Inner World using the A0 format, which measures 841mm x 1189mm. The design was created in Adobe Illustrator, a platform offering a wide variety of color palettes and fonts. The poster includes all necessary details, such as the game title, team member names, and required logos. Figure 6.1 shows the final look of game poster.

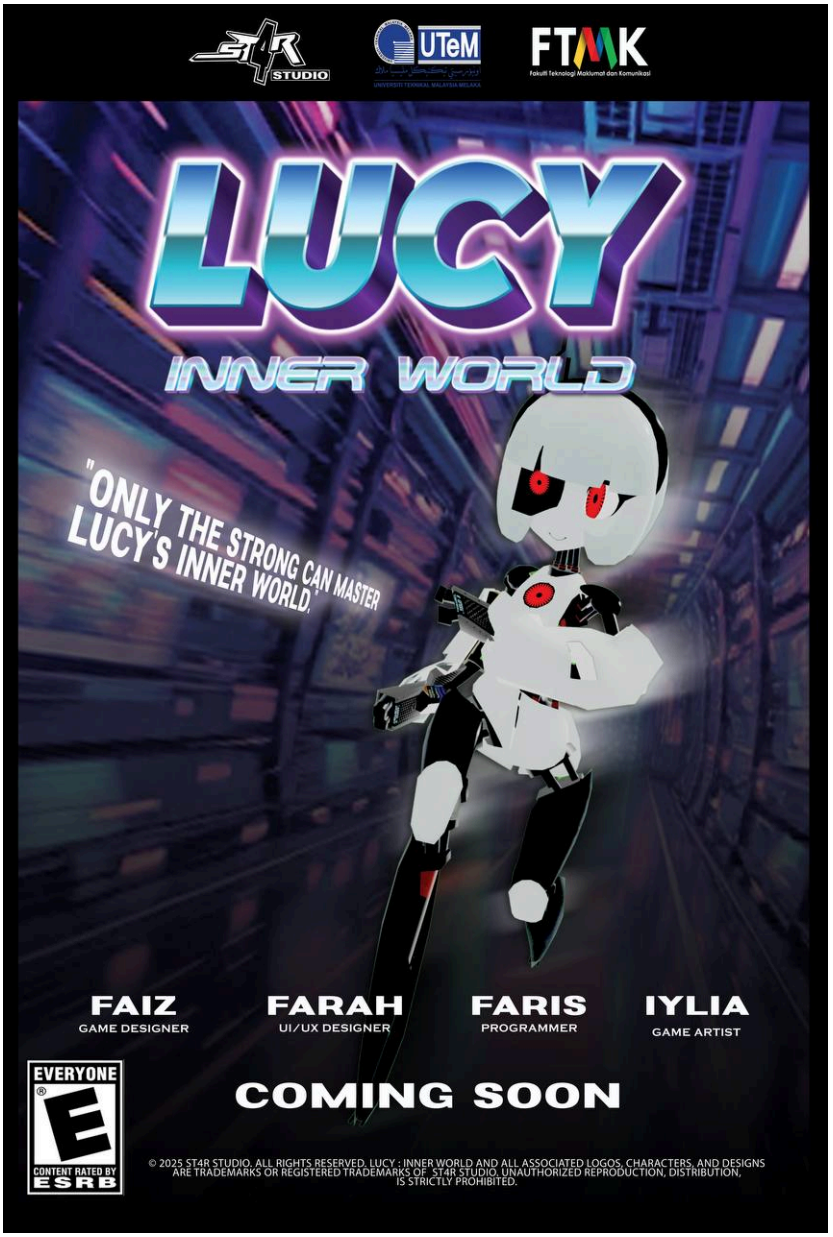

Figure 6.1 : Poster

6.5 Exhibition Item

We designed our group t-shirt using Adobe Illustrator, formatted to fit an A4 size. To make the t-shirt unique, we created a new design featuring our game's character alongside the title Lucy: Inner World. Additional details were added to enhance the design and make the shirt a distinctive representation of our game. Figure 6.2 shows the design of the team t-shirt.

Figure 6.2 : T-shirt mock-up

6.6 System Constraint

The game can only be run on a PC and requires specific system specifications to ensure optimal quality and performance. Meeting these requirements ensures smooth gameplay, with no lag or stuttering, allowing the game to run at its best on a suitable PC.

6.7 Summary

An effective marketing strategy is crucial for promoting our game. By creating an eye-catching poster, ensuring smooth gameplay, and presenting an exciting game trailer, we aim to capture the interest of potential players and encourage them to explore and enjoy our game.

CHAPTER VII

CONCLUSION AND SUGGESTION

7.1 Introduction

The conclusion of *Lucy: Inner World* provides players with a memorable and immersive experience that highlights the game's uniqueness. With the game now finished, it is ready for further improvements aimed at enhancing its distinctiveness. The goal is to ensure that it not only captivates players but also stands out as a truly unforgettable gaming experience.

7.2 Achievement

One of the key achievements of *Lucy: Inner World* is its unique story and style, which fit perfectly with the artificial intelligence theme. The game explores emotions in an innovative way, allowing players to experience and understand how AI processes human feelings. This emotional depth makes the game stand out from others in its genre.

The side-scrolling 3D gameplay provides an exciting and challenging experience. Players must navigate Lucy through different emotional levels, solving puzzles and overcoming obstacles, which makes the journey both fun and rewarding. However, the game can be difficult for players who are not familiar with puzzle games or gaming in general, as they need to use the environment as a hint to solve puzzles. This aspect might be challenging for those who are not accustomed to this type of gameplay. Despite this, we are proud of the unique and immersive experience the game offers, and we plan to improve areas like accessibility and puzzle clarity in future updates.

7.3 Suggestion

At certain points in the game, the camera view is obstructed due to the arrangement of obstacles and the side-scrolling style, limiting player visibility. Adjusting the camera angles or rethinking the obstacle layout could help address this issue. Additionally, the lighting and overall visual design of the game should be refined to enhance the atmosphere and improve the player's experience.

7.4 Conclusion

In conclusion, we are satisfied with the progress made in the development of the game. However, recognizing the dynamic nature of the gaming industry, we acknowledge the need for further improvements. This awareness encourages us to strive for continuous refinement, ensuring that the game aligns with the highest industry standards. By consistently enhancing the game's quality, we aim to provide players with an exceptional experience that exceeds expectations and stands out in the competitive market.

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ATTACHMENT

Picture 1: Group photo during showcase

Picture 2 : Judges evaluate our game

Picture 3 : Visitors playtest our game