# 

# Project Proposal

**Group 2**

John Alabasinis - 22090614  
Jana Nasrallah - 22079884  
Salman Rashid - 22080099

**Professional Experience**

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# High-Level Business Functions

| **ID** | **High Level Business Function** | **Ranking** |
| --- | --- | --- |
| **BF1** | **Game Environment Management** - Create and update the interactive space by dragging and dropping objects. | Essential |
| **BF2** | **Object Management** - Store and categorise CPTED-related objects such as lighting, cameras and benches. | Essential |
| **BF3** | **Scoring System** - Award or deduct points based on the player’s object placement and safety decisions. | Essential |
| **BF4** | **User Progress Tracking** - Track game completion, scores, and learning outcomes. | Essential |
| **BF5** | **User Authentication and Profiles** - Allow players to make and manage profiles/accounts. | Optional |
| **BF6** | **Feedback and Learning Support** - Provide real-time tips, feedback, or CPTED explanations. | Essential |
| **BF7** | **Tutorial/Onboarding Flow** - Introduces users to the game mechanics and CTPED concepts before gameplay begins. | Essential |
| **BF8** | **Analytics and Reporting** - Collect data on object usage and decision trends to analyse patterns in decision-making | Optional |

# Functional Requirements (User Stories)

| **ID:** FR\_1 | | **Feature:** Drag and drop objects | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Game Environment Management - BF1 | | | **Estimate:** 6 hours | | |
| **Story:**  As a player, I want to click and drag safety-related objects into the environment so that I can make it safer. | | | | | |

| **ID:** FR\_2 | | **Feature:** Dynamic feedback | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Feedback and Learning Support - BF6 | | | **Estimate:** 8 hours | | |
| **Story:**  As a player, I want to see visual feedback when I place objects so that I can understand how they affect the safety of nearby areas. | | | | | |

| **ID:** FR\_3 | | **Feature:** Points system | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Scoring System - BF3 | | | **Estimate:** 6 hours | | |
| **Story:**  As a player, I want to gain or lose points as I am placing objects so that I know if I am making the area safer or not. | | | | | |

| **ID:** FR\_4 | | **Feature:** Undo/Remove objects | | **Priority:** Optional | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Game Environment Management - BF1 | | | **Estimate:** 5 hours | | |
| **Story:**  As a player, I want to be able to reposition/remove objects so that I can correct any mistakes or so that I can earn more points. | | | | | |

| **ID:** FR\_5 | | **Feature:** Informative tooltips | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Feedback and Learning Support - BF6 | | | **Estimate:** 4 hours | | |
| **Story:**  As a player, I want to receive informative tooltips when I hover over an object so that I can learn how it relates to CPTED principles. | | | | | |

| **ID:** FR\_6 | | **Feature:** Multiple levels | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Tutorial/Onboarding Flow - BF7 | | | **Estimate:** 20 hours | | |
| **Story:**  As a player, I want to play through different levels so that I can apply CPTED concepts to various public spaces. | | | | | |

| **ID:** FR\_7 | | **Feature:** Level selection | | **Priority:** Optional | |
| --- | --- | --- | --- | --- | --- |
| **BF:** User Progress Tracking - BF4 | | | **Estimate:** 3 hours | | |
| **Story:**  As a player, I want to select or replay levels from a menu so that I can improve my performance or explore different environments. | | | | | |

| **ID:** FR\_8 | | **Feature:** Dynamic sounds | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** User Progress Tracking - BF4 | | | **Estimate:** 5 hours | | |
| **Story:**  As a player, I want the background sound to change based on the safety level so that I receive audio cues about my performance. | | | | | |

| **ID:** FR\_9 | | **Feature:** Real time score | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** User Progress Tracking - BF4 | | | **Estimate:** 3 hours | | |
| **Story:**  As a player, I want to see my current score during the game so that I know how well I am doing in real time. | | | | | |

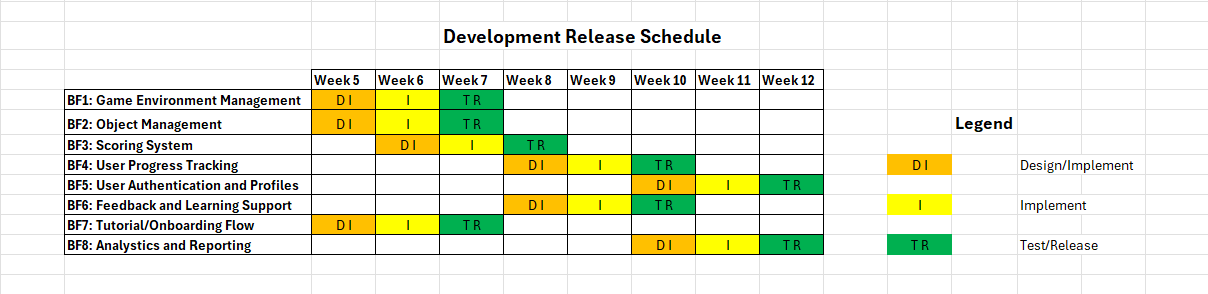
| **ID:** FR\_10 | | **Feature:** Post completion report | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Feedback and Learning Support - BF6 | | | **Estimate:** 5 hours | | |
| **Story:**  As a player, I want to receive a detailed report after completing a level so that I can learn what I achieved and how to improve. | | | | | |

| **ID:** FR\_11 | | **Feature:** Safety final rating | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Feedback and Learning Support - BF6 | | | **Estimate:** 3 hours | | |
| **Story:**  As a player, I want to get a final rating so that I have a clear measure of success. | | | | | |

| **ID:** FR\_12 | | **Feature:** Interactive UI | | **Priority:** Essential | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Object Management - BF2 | | | **Estimate:** 4 hours | | |
| **Story:**  As a player, I want a sidebar with draggable objects and information so that I can easily interact with and learn about my tools. | | | | | |

| **ID:** FR\_13 | | **Feature:** Pause/Restart options | | **Priority:** Optional | |
| --- | --- | --- | --- | --- | --- |
| **BF:** Game Environment Management - BF1 | | | **Estimate:**  2 hours | | |
| **Story:**  As a player, I want to pause or restart the level so that I can take breaks or try again if needed. | | | | | |

# Development Release Schedule



# Cost-Benefit Analysis

|  | **Year 0** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| --- | --- | --- | --- | --- | --- | --- |
| **Development Costs** | -$9,000 |  |  |  |  |  |
| **Operation & Maintenance Cost** | -$200 | -$400 | -$500 | -$600 | -$700 | -$800 |
| **Cumulative Costs** | -$9,200 | -$9,600 | -$10,100 | -$10,700 | -$11,400 | -$12,200 |
| **Benefits from new system in operation** | $0 | $1,500 | $3,000 | $6,000 | $8,500 | $11,000 |
| **Cumulative Benefits** | $0 | $1,500 | $4,500 | $10,500 | $19,000 | $30,000 |
| **Cumulative Costs vs Benefits** | -$9,200 | -$8,100   |  | | --- | | -$5,600 | -$200 | +$7,600 | +17,800 |

| **Description** | **Explanation** |
| --- | --- |
| **Development Costs** | Estimated based on 3 team members working 10 hrs/week for 12 weeks at $25/hour. One-time cost to build and deliver the game. |
| **Operation & Maintenance Cost** | Ongoing costs for small updates, hosting, occasional bug fixes or future improvements. Increases as usage grows. |
| **Cumulative Costs** | Adds each year’s new costs to the previous total. |
| **Benefits from new system in operation** | Tangible and intangible value to the client: public engagement, educational value, eligibility for funding, long-term community impact. |
| **Cumulative Benefits** | Adds up all previous years’ benefits. Shows how value builds over time. |
| **Cumulative Costs vs Benefits** | Subtract cumulative costs from cumulative benefits. Positive value means return on investment has been achieved. |

*\*Please keep in mind that for now, these are estimates.*