

Project Proposal

Group 2

John Alabasinis - 22090614

Jana Nasrallah - 22079884

Salman Rashid - 22080099

Professional Experience

Table of Contents

Project Proposal.....	1
Table of Contents.....	2
Problem Statement.....	3
Introduction.....	4
Executive Summary.....	5
High-Level Business Functions.....	6
Functional Requirements (User Stories).....	7
Development Release Schedule.....	10
Cost-Benefit Analysis.....	11
Conclusion.....	12

Problem Statement

Public awareness and understanding of Crime Prevention Through Environmental Design (CPTED) principles remain limited, despite their proven effectiveness in enhancing community safety. Traditional teaching methods, such as lectures or written materials, often fail to provide learners with an engaging, practical way to understand how urban design decisions influence crime prevention.

This lack of accessible, interactive learning tools creates a gap between theoretical knowledge and real-world application. As a result, learners may struggle to translate CPTED principles into practice, and community stakeholders risk overlooking design choices that can significantly impact safety and wellbeing.

The challenge is to create a system that not only communicates CPTED concepts effectively but also allows users to experiment, receive feedback, and understand the consequences of their decisions in a safe and controlled environment. Without such a solution, opportunities to promote community safety through education and awareness will continue to be underutilised.

Introduction

This proposal presents the PX Project, an innovative game-based platform designed to educate users on Crime Prevention Through Environmental Design (CPTED) principles. The system uses interactive gameplay to demonstrate how thoughtful object placement, such as lighting, surveillance, and street furniture, can influence the safety and usability of public spaces.

The PX Project goes beyond a standard learning tool; it demonstrates how digital engagement can foster safer communities. Using drag-and-drop mechanics, dynamic scoring, and real-time feedback, the system bridges theory with practice in a format that is accessible, engaging, and impactful.

Executive Summary

The PX Project delivers a cost-effective, scalable solution for community safety education. Through a simulated environment, players actively design safer spaces by placing CPTED-related objects and receiving real-time feedback on their decisions. This experiential approach not only reinforces learning but also promotes awareness of how urban design contributes to public safety.

Core features include:

- Environment and Object Management: Build and customise spaces with safety-enhancing objects.
- Scoring and Feedback: Measure the effectiveness of player decisions through points, ratings, and visual/audio cues.
- User Progress Tracking: Record scores, completion, and outcomes for individual users.
- Learning Support: Provide tooltips, onboarding tutorials, and post-completion reports to deepen understanding.

The project is estimated at \$9,000 in development costs, with minimal annual maintenance expenses. The project delivers both tangible and intangible benefits, including stronger community engagement, measurable educational value, and eligibility for grant funding. A positive return on investment is expected by Year 3, with significant cumulative gains by Year 5.

This proposal demonstrates a sustainable and impactful initiative that combines modern learning methods with community safety outcomes.

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

Development Release Schedule									
	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
BF1: Game Environment Management	DI	I	TR						<div>Legend</div> <div>DI</div> Design/Implement <div>I</div> Implement <div>TR</div> Test/Release
BF2: Object Management	DI	I	TR						
BF3: Scoring System		DI	I	TR					
BF4: User Progress Tracking				DI	I	TR			
BF5: User Authentication and Profiles						DI	I	TR	
BF6: Feedback and Learning Support				DI	I	TR			
BF7: Tutorial/Onboarding Flow	DI	I	TR						
BF8: Analytics and Reporting						DI	I	TR	

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.*

Conclusion

The PX Project offers stakeholders a forward-thinking approach to safety education, leveraging gamification to make CPTED principles both accessible and engaging. With clear functionality, a defined development schedule, and strong financial justification, the system is positioned as a practical and high-value solution.

By blending interactive technology with real-world relevance, the project provides measurable learning outcomes and long-term community benefits. This ensures that stakeholders are investing not only in an innovative digital product but also in a meaningful initiative that builds safer, more informed communities.