

**Cybersecurity Awareness Game**

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**Project**

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# Project Description

## Project Overview

In today’s digital age, cybersecurity awareness is essential to protect individuals and organizations from growing cyber threats. This project proposes an interactive game designed to raise awareness about various types of cyberattacks—such as phishing, ransomware, and social engineering—while teaching best practices for prevention. The game simulates realistic attack scenarios and incorporates AI-generated questions and challenges via an API to test and enhance users’ cybersecurity knowledge. This engaging, educational approach is intended to improve individual skills and serve as an effective training tool for organizations and educational institutions.

## Objectives:

## Raise Awareness: Increase understanding of cybersecurity threats and the importance of robust preventive measures.

## Engaging Learning Experience: Provide an interactive, gamified simulation of real-world cyberattack scenarios.

## Continuous Improvement: Utilize dynamic, AI-generated questions that adapt to the user’s performance to reinforce learning.

## Versatility: Offer a tool that can be used for personal self-improvement, corporate training, and integration into educational curricula.

## Background:

## Extensive research into existing cybersecurity awareness tools, educational platforms, and gamification methods informed this project. Discussions with cybersecurity experts and IT professionals helped shape the design and content, ensuring that the game reflects realistic threat scenarios and effective countermeasures. This project addresses gaps found in current tools by combining gamification with dynamic, AI-driven content for a unique, adaptive learning experience.

## Literature Review:

## Top Level View

## Cybersecurity awareness has become a critical issue in the digital age. Traditional methods like seminars and static online courses are giving way to more interactive, engaging approaches. The core challenge lies in effectively engaging diverse audiences—individuals, corporate employees, and students—while presenting complex cyber threat information in an accessible format. Key factors include:

## User engagement and motivation

## Realistic simulation of cyberattack scenarios

## Adaptive learning through AI-generated challenges

## Balancing educational content with gamified interactivity

## Historical Review:

## Early cybersecurity training relied heavily on manual instruction, static presentations, and one-size-fits-all content. Over time, training evolved to include computer-based simulations and online modules. Recently, gamification and interactive learning have emerged as powerful methods to improve retention and practical skills. Research has shown that engaging, game-based learning environments can enhance understanding of complex subjects such as cybersecurity by providing hands-on, simulated experiences.

## Current Trends:

## Recent advancements focus on:

## AI and Machine Learning: Adaptive learning systems now use AI to generate dynamic questions and scenarios, personalizing the training experience.

## Gamification: Points, badges, and leaderboards are increasingly used to motivate learners and sustain engagement.

## Real-Time Simulations: Cyberattack simulations are becoming more realistic, providing users with immediate feedback on their responses.

## User-Centric Design: Modern platforms prioritize intuitive interfaces and customizable learning paths to cater to varying skill levels.

## Relevance to Our Project:

## Our project aims to develop an interactive game that raises cybersecurity awareness by combining realistic cyberattack simulations with AI-generated, adaptive questions. This approach directly addresses the shortcomings of traditional training methods by:

## Engaging users through interactive, gamified scenarios.

## Providing personalized learning experiences that adjust to the user's performance.

## Keeping content current and reflective of the ever-evolving cyber threat landscape.

## \

## Key Themes of Literature:

## Gamification in Cybersecurity Training

## Overview: Gamification leverages game-design elements—such as points, levels, and challenges—to increase motivation and engagement in learning environments.

## Relevance: These techniques are critical for our project, as they transform cybersecurity training from a passive to an active learning experience.

## Studies to Reference:

## “Gamification in Cybersecurity Training: Enhancing Engagement and Learning”

## “Interactive Learning: The Role of Gamification in Modern Education”

## AI-Driven Adaptive Learning

## Overview: AI systems can dynamically generate content and adjust the difficulty of challenges based on user performance.

## Relevance: AI-generated questions ensure that users receive personalized feedback and challenges that are neither too simple nor overwhelming.

## Studies to Reference:

## “Adaptive Learning Systems in Cybersecurity Education”

## “The Impact of Artificial Intelligence on Educational Content Delivery”

## Simulation of Cyberattack Scenarios

## Overview: Realistic simulations are used to mimic actual cyber threats, providing learners with practical, hands-on experience.

## Relevance: By experiencing simulated phishing, ransomware, and social engineering attacks, users can better understand threat indicators and prevention strategies.

## Studies to Reference:

## “Simulation Techniques for Cybersecurity Training”

## “Real-World Cyberattack Simulations as an Educational Tool”

## Challenges in Cybersecurity Training

## Common Challenges: Ensuring up-to-date content, maintaining user engagement, and integrating advanced AI features without overwhelming the learner.

## Relevance: Our project tackles these challenges by focusing on continuous adaptation and user-centered design.

## Studies to Reference:

## “Overcoming Challenges in Cybersecurity Education”

## “Innovative Approaches to Enhance Cybersecurity Awareness”

## Research Gaps and Opportunities:

## Real-Time Adaptation: While many systems offer static content updates, there is a significant opportunity to develop AI-driven modules that adapt in real time to emerging cyber threats.

## Integration of User Preferences: Although personalization is gaining traction, incorporating continuous, real-time user feedback into cybersecurity training remains underexplored.

## Sustained Engagement: Many educational tools struggle with maintaining long-term engagement. Research into more effective gamification strategies could lead to higher completion rates and better learning outcomes.

## Hybrid Approaches: Combining simulation-based learning with AI-driven adaptive content and gamification represents a promising area for further research and innovation.

## Conclusion

## Cybersecurity training has evolved significantly—from traditional classroom lectures to dynamic, interactive simulations. Advanced techniques such as gamification, AI-driven adaptive learning, and real-time simulations are transforming how users learn about cyber threats. However, challenges such as maintaining up-to-date content, integrating real-time user feedback, and ensuring sustained engagement still persist. These challenges also present opportunities for future research and development, particularly in creating hybrid models that combine multiple advanced techniques to deliver a more flexible, scalable, and effective cybersecurity training solution.

## Applications:

## Personal Use: Individuals can use the game to improve their ability to identify and counteract cyber threats.

## Corporate Training: Organizations can integrate the game into employee training programs to bolster cybersecurity defenses and compliance.

## Educational Institutions: Schools and universities can incorporate the game into curricula or workshops to teach cybersecurity fundamentals.

## Alternative Designs:

## The project will be developed as a web application, ensuring accessibility across devices. Key features include:

## Interactive Scenarios: Simulations of real-world cyberattacks (e.g., phishing emails, ransomware alerts) that allow users to experience and learn from realistic attack scenarios.

## AI-Generated Questions: Dynamic questions tailored to the user’s progress, providing personalized feedback and reinforcement.

## Gamified Elements: Incorporation of points, badges, and leaderboards to promote engagement and sustained participation.

## Customizable Levels: Offering multiple modes—Beginner, Intermediate, and Expert—to cater to varying levels of cybersecurity knowledge.

# Project Planning

# Requirements

## Use Cases

This section begins to describe in more specific and precise detail exactly what steps the system takes in the course of its performance. Use cases serve not only to more specifically define the system (and its boundaries), but also to identify functional requirements, to identify initial objects / classes, and to organize the work.

## Functional Requirements

## Data Requirements

## Non-Functional Requirements

Performance Requirements

Dependability Requirements

Maintainability and Supportability Requirements

Security Requirements

Usability and Humanity Requirements

Look and Feel Requirements

Operational and Environmental Requirements

Cultural and Political Requirements

Legal Requirements

# Design

## Class Diagrams

## Dynamic Model

## Subsystem Decomposition

## Hardware / software mapping

## User Interface

# Test Plans

Features to be tested / not to be tested

Pass/Fail Criteria

Approach

Suspension and resumption

Testing materials (hardware / software requirements)

Test cases

Testing schedule

# Implementation

Output

# Results Evaluation

# Conclusion

## Summary

## Novelty

## Integrity and Values

## Future Work

# References / Bibliography

: Cite all ideas, concepts, text, data that are not your own. If you make a statement, back it up with your own data or a reference. All references cited in the text must be listed. There are two main ways to cite a reference within a text:

Citing the reference by author’s name: the author’s name must be placed at the end of the sentence that is taken from that reference along with the year of publication, then in the reference section the author’s name is to be arranged in alphabetical order.

Citing the reference by numbers: you should start numbering from 1 and continue according to order of appearance in text. Numbers should be placed the end of the sentence that is taken from that reference, then in the reference section you start your reference list from number 1.

You are recommended to use the APA writing style, which cites the reference by the author’s name, in your references’ citations.

The first line of each entry in your reference list should be on the left margin. Subsequent lines should be indented five spaces from the margin. All references should be double-spaced. Capitalize only the first word of a title or subtitle of a work. Italicize titles of books and journals. Note that the italicizing in these entries often continues

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Authors' names are inverted (last name first); give last name and initials for all authors of a particular work. Your reference list should be alphabetized by authors' last names. If you have more than one work by a particular author, order them by publication date, oldest to newest (thus a 1991 article would appear before a 1996 article). When an author appears as a sole author and as the first author of a group, list the one-author entries first. If no author is given for a particular source, alphabetize by the title of the piece and use a shortened version of the title for parenthetical citations. Use "&" instead of “and” on the reference page and only within parentheses when citing multiple authors of a single work in your text. At the end of the project list all references cited in the text in alphabetical order.

For an article in a journal:

***Author, A. A., Author, B. B., & Author, C. C. (Year of Publication). Title of article. Title of periodical, Volume Number, pages.***

Example 1: Harlow, H. F. (1983). Fundamentals for preparing psychology journal articles. Journal of Comparative and Physiological Psychology, 55, 893-896.

Example 2: Kernis, M. H., Cornell, D. P., Sun, C. R., Berry, A., & Harlow, T. (1993). There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. Journal of Personality and Social Psychology, 65, 1190-1204.

For a chapter in a book:

***Author, A. A., & Author, B. B. (Year of Publication). Title of chapter. In A. Editor &***

B. Editor (Eds.), Title of book (pages of chapter). Location: Publisher. When you list the pages of the chapter or essay in parentheses after the book title, use "pp." before the numbers: (pp. 1-21).

Example: O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), Gender issues across the life cycle (pp. 107-123). New York: Springer.

For a web page:

***Author, A. A., & Author, B. B. (Date of Publication or Revision). Title of full work [online]. Retrieved month, day, year, from source Web site: URL.***

Example: Chou, L., McClintock, R., Moretti, F. & Nix, D. H. (1993.) Technology and education: New wine in new bottles: Choosing pasts and imagining educational futures. Retrieved August 24, 2000, from Columbia University Institute for Learning Technologies Web site: <http://www.ilt.columbia.edu/publications/papers/newwine1.html>

For an online journal:

***Author, A. A., & Author, B. B. (Date of Publication). Title of article. Title of periodical, xx, xxx-xxx. Retrieved month, day, year, from URL.***

Example: Frederickson, B. L. (2000, March 7). Cultivating positive emotions to optimize health and well-being. Prevention &Treatment, 3 Article 001a. Retrieved November 20, 2000, from <http://journals.apa.org/prevention/volume3/pre0030001a.html>

# Appendix

Glossary

Naming Conventions and Definitions

Code and links

User Manual