

Title

Assignment 1: Innovation & Project Management

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Module: Changemakers: Creativity & Value Creation

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Innovation

Innovation is usually described as coming up with new ideas or improving existing things so they work better. It has played a big role in shaping societies throughout history. Even very early developments such as basic tools or writing systems changed how people lived. These inventions made it easier to complete everyday tasks and also helped people communicate and organise themselves in larger groups. As time went on, innovation continued to influence the way societies developed, especially once technology started advancing more quickly. In the last few decades this has become even more noticeable with the growth of digital technology and computer systems [1].

Technology is now involved in most parts of everyday life. People use smartphones, laptops and online services constantly, whether it is for communication, work or entertainment. Because of this, many workplaces rely heavily on digital systems and software. This means employees are expected to understand technology to some extent. Pink explains that creativity and problem solving are becoming increasingly important skills in modern workplaces, partly because many routine tasks are now handled automatically by computers or software [2].

Another way people often explain technological progress is through the idea of industrial revolutions. Schwab describes the current period as the Fourth Industrial Revolution, where digital technology is becoming deeply connected with the physical world [3]. Technologies such as artificial intelligence, automation and advanced computing are already starting to change the way businesses operate. For example, many industries now rely on automated systems or data driven decision making. At the same time, these developments also introduce new problems.

Technological development can also be looked at through something called Kondratieff Waves. This theory suggests that major technological breakthroughs tend to happen in long cycles that affect economic growth for several decades. Historically, inventions like steam engines, electricity and mass production caused major shifts in industry and the economy [4].

Creativity is an important part of innovation because new ideas usually start with creative thinking. This often involves looking at problems from different angles and trying possible solutions. Kelley and Kelley argue that creativity is not limited to artistic careers and that most people are capable of developing it through practice and experimentation [5].

Overall, innovation continues to shape modern society and will likely remain important as technology keeps developing.

Ideation

When planning this project, several possible ideas connected to computing and cybersecurity were explored. One idea involved designing a mobile application that could help users recognise phishing emails. The application would analyse the content of messages and highlight suspicious features that may indicate a scam.

Another idea was the creation of a browser extension designed to warn users before they visit potentially dangerous websites. This type of tool could scan links or domains and display warnings if the site appeared suspicious.

A third option involved creating an interactive simulation that demonstrates the effects of cyberattacks. Instead of simply explaining the risks, users would experience a scenario where their decisions directly affect the outcome.

After considering these ideas, the simulation concept appeared to be the most engaging and practical to develop. The project therefore focuses on creating a small educational game using Unreal Engine that shows what can happen when phishing emails or malicious links are opened.

Project Title

PhishGuard: A First-Person Simulation of Phishing Attack Consequences

Aim

To develop an interactive simulation that helps demonstrate the risks associated with phishing emails.

Objectives

- Create a small interactive environment using Unreal Engine.
- Allow the player to interact with emails displayed on a computer screen.
- Include malicious email examples.
- Demonstrate the possible impact of clicking unsafe links.

The main idea behind the simulation is to place the player inside a small virtual workspace. In front of them is a computer monitor displaying an inbox with several messages. Some messages are harmless, while others contain phishing attempts designed to trick the player.

The player must decide which emails appear safe and which should be ignored. If a malicious link is selected, the simulation triggers an event showing the consequences of the decision. For example, the screen may display a ransomware message or indicate that the system has been compromised.

Research

Several resources will be used while developing the project. Unreal Engine tutorials and documentation provide guidance on building environments and creating interactive elements within the software [6]. These resources are helpful when learning how to design scenes, create user interfaces and implement gameplay mechanics.

Cybersecurity research will also be reviewed to ensure that the phishing examples included in the simulation are realistic. Research shows that phishing continues to be one of the most commonly used techniques by cybercriminals because it targets human behaviour rather than weaknesses in software systems [7].

In addition, studies related to gamification suggest that interactive learning environments can help improve understanding because users actively participate in the experience rather than simply reading information [8]. This makes simulation-based learning particularly useful for demonstrating cybersecurity risks.

Q.1

The purpose of this project is to create a small interactive simulation that demonstrates the consequences of phishing attacks. The project will be developed using Unreal Engine and will place the player inside a simple digital workspace environment.

Within the simulation, the player interacts with a computer monitor displaying several emails. Each email presents a possible action, such as opening a link or downloading an attachment.

If the player interacts with a malicious message, the simulation will trigger an event representing a cyberattack. For example, the screen may display a ransomware message or show that confidential data has been accessed. The intention is to highlight how small decisions can sometimes lead to serious security problems.

Unreal Engine 5 will be the primary software used for development. The engine provides tools for building 3D environments and creating interactive systems. One of the most useful features included in Unreal Engine is Blueprint, a visual scripting system that allows developers to create gameplay logic without writing large amounts of traditional code.

Blueprint will be used to control the interactions within the email interface. For example, clicking a link inside an email can trigger different outcomes depending on whether the message is safe or malicious.

To create the environment more efficiently, publicly available 3D assets will be used. Using existing assets saves development time and allows the project to focus more on the interactive elements of the simulation.

Cybersecurity research will also play a role during development. Phishing attacks remain one of the most common cyber threats because they rely on human behaviour rather than technical vulnerabilities [7].

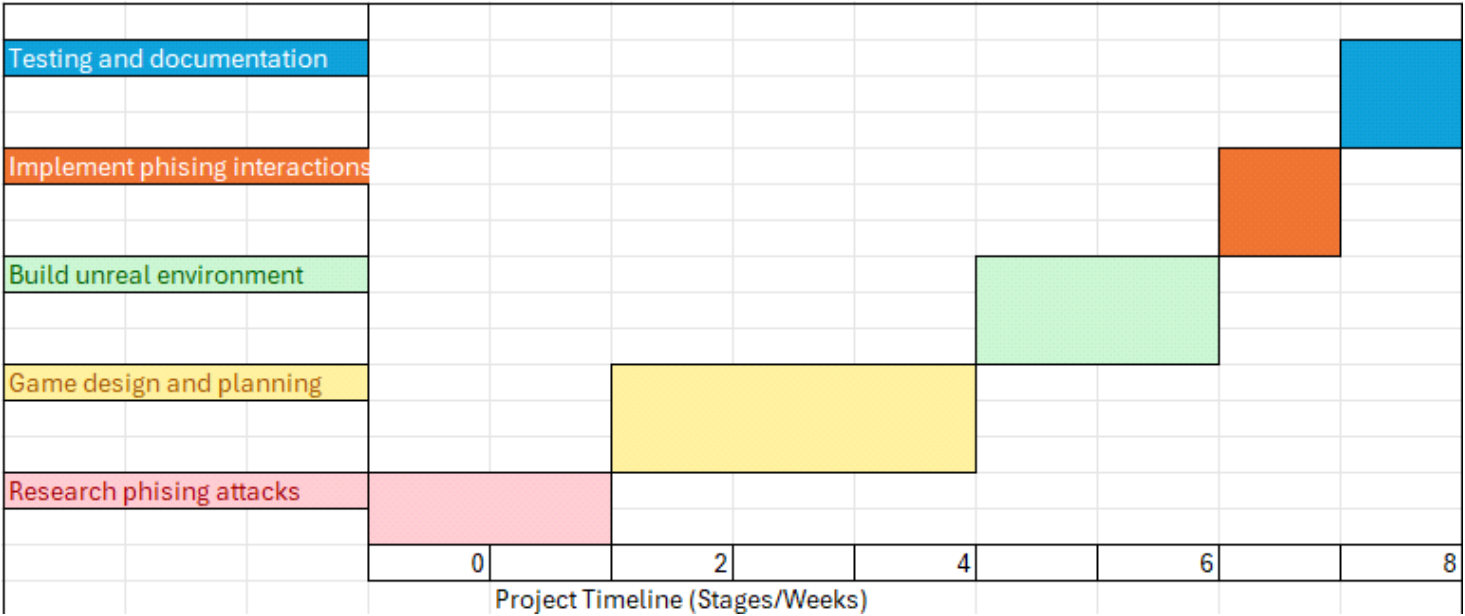
The development process will follow several stages. The first stage involves researching phishing attacks and planning the design of the simulation.

The next stage focuses on building the environment inside Unreal Engine. This includes setting up the first-person camera, placing objects within the scene and adding the computer monitor that displays the email interface.

After the environment has been created, the interactive features will be implemented. Blueprint scripting will be used to create clickable links within the email interface that trigger different outcomes depending on the player's choices.

The final stage involves testing the simulation to ensure that the interactions work correctly. Any problems discovered during testing can then be corrected before the project is finalised.

Q.2



Q.3

Several challenges may arise during development. One potential issue is the complexity of creating interactive systems within a game engine. Although Unreal Engine provides many useful tools, implementing gameplay logic can still take time.

Another challenge is the limited time available to complete the project. Game development projects can quickly become complicated if too many features are included. To keep the project manageable, the environment will remain relatively small and focused on the main concept.

Ensuring that the phishing examples appear realistic is also important. If the messages are not believable, the educational value of the simulation may be reduced. Research from cybersecurity reports will therefore be used when designing the email examples.

It is also important that the simulation remains easy to understand. If the system becomes too technical, players may not fully understand the cybersecurity message being presented. Providing clear visual feedback when attacks occur will help ensure that the outcomes are easy to interpret.

Q.1

The project will follow an Agile development approach. Agile is commonly used in software and game development because it focuses on building projects gradually through smaller stages rather than attempting to complete everything at once [9].

This approach allows developers to test features regularly and make improvements as the project progresses. Instead of designing the entire system in detail at the beginning, the project evolves over time as new ideas and adjustments are introduced.

For this simulation, development is divided into several stages. Each stage focuses on a specific feature, such as building the environment or creating the email interaction system. After each stage is completed, the feature can be tested before moving on to the next step.

Working in this way helps identify problems early and makes it easier to refine the design if necessary. This is particularly useful when developing interactive systems, as some features may need adjustment once they are tested within the game environment.

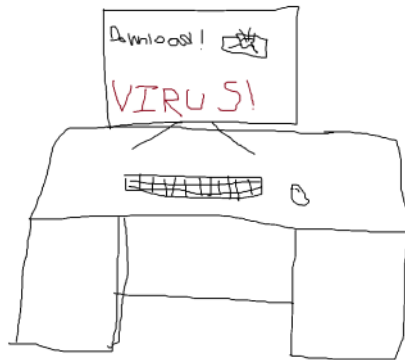
Q.2

Before development began, two simple design elements were prepared to help guide the project. The first element is a list of core requirements. These outline the main features that the simulation should include, such as the first-person perspective, the email interface and the events triggered when malicious links are selected. Defining these requirements helps keep the project focused on its intended purpose.

The second design element is a flowchart showing how player decisions affect the outcome of the simulation. The diagram shows the sequence of events that occur when the player receives an email and decides whether or not to interact with it. If the link is safe, nothing negative happens. If the link is malicious, the system triggers a simulated cyberattack event.

Flowcharts are commonly used in software development because they provide a clear visual representation of system behaviour and decision pathways [10].

Below is a brief visualisation created in the design process and was used in the development process as a baseline for the vision of the project.



Below is a flow chart also used for the development process

Email Free music Download		ERROR! Virus Detected
Company loses: £13000	Your loss: Trust Job	Try Again?

Q.3

The first stage of implementation involved building a basic workspace environment within Unreal Engine. This environment includes a desk and computer monitor where the player views the emails. The first-person camera allows the player to move around the environment and look at the screen.

A user interface widget is fused to display the email system on the monitor. The interface includes several messages, each containing clickable options.

Using Blueprint scripting, these options trigger different events depending on the player's actions. Selecting a malicious link may display a ransomware message or indicate that the system has been compromised.

Images from the development process are included to show how the environment, interface and interaction systems were created. These visuals help demonstrate how the design ideas were translated into a working prototype.

By using a staged development process and keeping the design relatively simple, the project remains manageable while still demonstrating the main cybersecurity concepts.

Image of a desk like set up using free to use assets

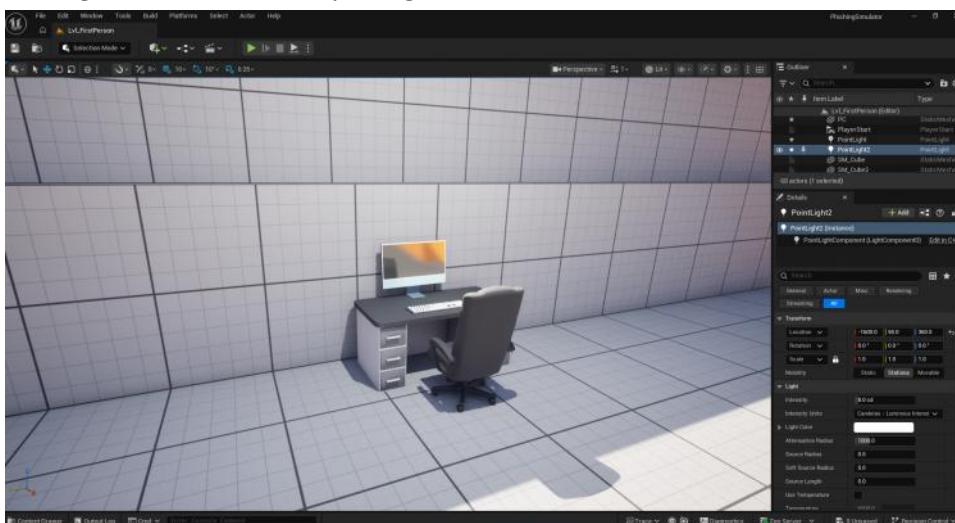
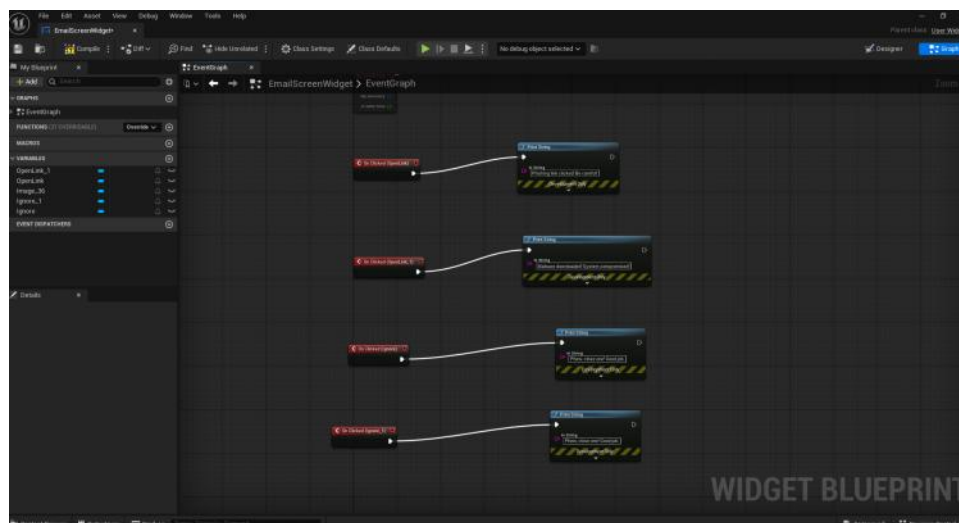


Image showing a widget overlay created to mask the screen and make it interactable, showing 2 basic potential scam emails, with buttons which are yet to be made interactable.





Image showing the logic being created to show a basic string output on screen when said buttons are clicked corresponding to the emails.



Fully functioning clickable buttons which display on the screen the consequences of clicking links or downloading attachments to potentially infectious emails.

References & Appendix

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Engaging with content during my cybersecurity research [10]

