Online Quiz Web Development Report

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Subject

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Date

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## Introduction

With the continued growth of computing and the Wide World Web as well as its application in the daily activities of people, the importance of cyber security is becoming evident and inescapable. Technology is increasingly being integrated with internet solutions and covering increasing facets of human life. As a result, a lot of data and digital footprint is generated by people during their daily use of technology. Additionally, this increased dependence on computing technology and internet breaches are more impactful. Privacy as well as other financial ramifications of information security breaches makes cyber security an active problem in society today.

Cyber security threats and the preventative techniques that may be applied towards them are rather broad. However, one of the most effective means of achieving security for individual information security is education and awareness. Most cyber-attacks prey on the unwitting nature of targeted users. Cyber-attack methods include techniques that apply deception tactics to take advantage of the ignorance of internet users. This is especially true since corporations, governments and application developers have become cognizant of the threat of cyber-attacks and taken technical preventative measures. This leaves cyber attackers opting for techniques oriented to the users such as social engineering.

Due to social engineering threats, there is a premium on user awareness as the central method for preventing cyber-attacks. This method significantly fortifies the cyber security architecture since it incorporates users who are the targets for attacks rather than the means. This report therefore investigates and seeks to develop and evaluate a design for educative cyber security, online, web-based quiz.

## Background Research

The exponential rise in the webspace has meant that there is a lot more information available to internet users. It is often difficult for a site to stand out from this dense forest of websites. This competition therefore often means developers and designers adopt various methods and designs. Sometimes, these methods and designs can mean that the end product is a website with more glitz than substance. Substance and content are often sacrificed for more visual appeal. Sometimes, sites can be clamped with a lot of visual effects that deflect from the core substance of the website. On the flip side, websites can drown users in vast quantities of content that they cannot absorb.

According to Albert L Ingram and Lesley G Hathorn (2003), instructional effectiveness and completeness in website design a comprehensive review of information, interactions and connection objectives. The report argues that an instructional analysis is critical to designing a model that avoids overloading a user with information (Ingram & Hathorn, 2013). According to their findings, ensuring that each content cluster is independent is crucially important (Ingram & Hathorn, 2013). They find that sounds, graphics, videos and animations attract a lot of attention which if deployed unnecessarily, can divert attention from the core content. Shorter pages, fewer words and effective information mapping were identified as the ultimate desirable objectives while developing educative websites. In their assessment, online quizzes can best be described with relatively few questions whose scores are recorded and evaluated immediately for students’ information. They find that this format can be useful in use cases where reinforcement of concepts is the main objective and where self-assessment by users as a guide to learning is intended.

Michael Nebeling and Moira C. Noorie (2013) investigated the concept of responsive web design. In their research, they identified the diversity of web browsing devices as the main imperative for the concept. Moreover, they establish that the underlying fluid grid concept is key to achieving this adaptability. According to the research, screen size, screen resolution, as well as input and output parameters necessitate responsive web design (Nebeling & Noorie, 2013). It references the available frameworks, especially with the development of HTML5 and CSS3 that are critical in implementing responsive web design. The research also establishes that taking advantage of fluid grids is the solution towards dynamic web designs that can adapt to the multiplicity of display interfaces today (Nebeling & Noorie, 2013). Such functionalities that web designers can take advantage of in HTML5 and CSS3 include the application of relative units such as ems and percentages rather than absolute units such as pixels during element sizing as well as application of media queries to adapt the position and orientation of elements to screen sizes and resolution.

Mircea Petrache acknowledges the difficulties that come with building websites today. He states that despite web design core technologies such as HTML and CSS being a relatively easy concept to master, designers can make mistakes that compromise the structure of websites. The insufficiency of comprehensively defined processes for web design, insufficient experience by web developers and time-constrained schedules are some of the specific problems in the area. These constraints more often than not usually cause designers to opt for either the visual design first approach or the technology-first approach. With the visual design first approach, developers perceive the site’s design document as a picture. This results in a design with giant or numerous images built mainly on flash. This often causes the site to be visually appealing at best but almost often inflexible and sacrificing functionality. On the other hand, the technology first design approach means that the designer primarily focuses on the technology after which the designer will decorate it. However, according to Petrache, the web development process model is best suited for a balanced and cohesive web design. He, therefore, proposes a deductive approach to guide this process. It includes; setting a purpose, building specifications, implementing the design, and finally testing it before release.

## Online Quiz Web Design

## Functional requirements

#### Interface requirements

1. The web application shall display a question at a time and allow the user to submit a response in form of an input
2. The main field receives only action button inputs to simplify the user interface
3. The web application shall have a toggle button to allow the user to toggle between visual modes

#### Accessibility requirements

1. The development of the website shall follow web accessibility standards
   * 1. The web application shall evaluate the accuracy of the responses
     2. The web application shall produce a performance report for the user
     3. The website shall allow for social sharing

#### Non-Functional Requirements

1. The web application shall be simple and concise
2. The web application shall be reliable and have fast performance
3. The web application shall be responsive to diverse types and sizes of screens and devices

#### Web Design

The first important aspect of designing a web-based application is the content. Content is core as it bears the essence of the project. Other factors are purposed to facilitate the delivery of content. Content, therefore, has to be curated as a basic standard. For this project, the quiz questions constitute the content. The questions will be designed to be simple, short and precise but carry all the necessary information intended. Web users usually offer only a limited time for a site to manifest its content. There is then a short moment that the user judges if the content is worth their time. This window of time is critical and the content should be capable of delivering intriguing information fast.

The questions consisted in the online quiz content will be formulated around the general area of end-user education. The questions will cover mainly social engineering threats within mobile security and storage security. More specific areas will include an investigating of awareness of malware, ransomware, and phishing as cyber threats. Moreover, the quiz will explore more technical areas of cyber security for advanced users such as man in the middle attacks, distributed denial of service attacks, and advanced persistent threats. Some of the questions will also be aimed at investigating and demystifying some dangerous myths about cyber security. Moreover, since, the purpose of the online is educational, the answer and additional information on the subject of the questions shall be revealed after the user's input.

SITE STRUCTURE

Homepage

SITE NAVIGATION

About

Share

Quiz

Results

Home page

RESULTS

Share

Resources

About Page

The motivation for the entire website is simplicity, elegance, efficiency and minimalism. This informs the decision to have a few pages. It is intended that a user can access the quiz as soon as they enter the site as much as possible thus why the quiz interface is positioned on the landing/home page.

#### Sample Quiz Questions

Some sample questions under proposition for this online quiz will include;

1. What actions do you take when you visit a site that the browser marks as insecure (URL denotes HTTP:// instead of HTTPS://)?
2. Ignore it altogether
3. Do not save personal information on the site
4. Inspect the site
5. Refuse to allow the site to save cookies
6. Which is the best way to manage passwords online?
7. Save passwords in email account-based cloud storage
8. Write down passwords
9. Use short passwords to remember
10. I use a common password for most online accounts
11. What actions do you take when you receive an unsolicited email from an unknown address?
12. Browse through links and media to identify potential malware
13. I delete it immediately
14. Reply to the sender asking for their identity
15. I ignore the message
16. How often do you take advantage of two-factor authentication when offered by a web service
17. Never
18. Sometimes
19. Always
20. What actions are you supposed to take when you are a victim of a ransomware attack (solicitation for money or specific actions in return for access to systems or data)
21. Shut down the computer, seek the assistance of a technician.
22. Pay out the ransom or perform the solicited actions.
23. Report to authorities immediately
24. Reboot the machine with a fresh system and relinquish the data captured
25. Negotiate with the attackers
26. What is the effect of private (incognito) browsing?
27. The feature makes me invisible to anybody including my internet service provider and other people
28. The feature makes me only invisible to my internet service provider but not authorities
29. The feature does not make me invisible to either my ISP or authorities but only stops my browser from saving browsing information
30. Does turning off your phone’s GPS location function disable internet services from discovering your location?
31. Yes
32. No
33. Would you use public Wi-Fi networks in places such as airports and cafes for browsing sensitive apps such as financial apps?
34. Yes, as long as they are password protected.
35. No

### 3.5. Design Features

#### 3.5.1. Visual display toggle

The visual display toggle button shall be positioned at the top left end of the site. It shall allow a user to choose their preferred display mode between the default “Normal” mode and an optional “Dark” mode. Its purpose shall enhance the visual appeal if the user opts. Additionally, it shall enable the site to be more accessible to persons with disabilities. By adjusting the contrast and colour schemes of the site, the feature shall enable users of all origins and the ability to access the content.

#### 3.5.2. Landing page

The landing page shall be the “Home” page and one of the two pages of the site where a simple but elegant design will be implemented. It will contain the core functionalities and content of the website. This choice is informed by the objectives and goals of the site. With it being straightforward and with a sole functional purpose, the design is best to be centred on that purpose and execute it excellently.

This page shall have a white background to cast attention on the content as much as possible. The page’s header section shall be plain and only contain a few navigation links. The centre of the page shall contain the core content of the website and a visual appeal shall be focused there.

#### 3.5.3. Card design

The site shall have a card design implemented with a CSS3 grid structure and other styling properties. This section shall be central and have a card design. The section shall also have smooth transition effects between the questions and answer interfaces. The main function of this feature design is to draw attention to the content it carries and also encourage the user to interact with the section.

#### 3.5.4. Color scheme

The colour scheme of the website shall comprise a dominant plain white background in normal mode. The text colour shall be black and a simple font type and size shall also be used. A glossy and transparent background on the card design shall also be used. In dark mode, a darker colour in the background shall be contrasted with a lighter colour in the foreground.

#### 3.5.5. Mobile compatibility

The website shall also embrace compatibility across diverse devices. Using CSS3 media queries and adjustable viewports, the design shall adapt accordingly to screen sizes.

#### 3.5.6. Effective navigation

The design shall also implement seamless and smooth transitions and page navigation.

#### 3.5.7. Well formatted content

The content shall be highly formatted for appeal to the user and seek to communicate the message easily, fast and with intrigue. This will be achieved with the integration of visual elements including font, icons and text orientation. The content will also be formatted for clarity and completeness to be able to communicate to the user effortlessly. Additionally, the content will be Search Engine Optimized.

#### 3.5.8. Accessibility

Web accessibility shall be considered during the site’s development. The typography, site hierarchy, colour contrast, alternate text and labels, simple writing, application of consistent navigation, clear focus states, useful error states shall all be implemented in the site to ensure that it is more accessible to persons with disability.

#### 3.5.9. Social Sharing

The social sharing feature shall enable users to share the quiz or their results amongst other people through popular social media platforms.

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