A CYBERSECURITY RESOURCE HUB FOR MOBILE USERS IN DEVELOPING COUNTRIES

Presented by

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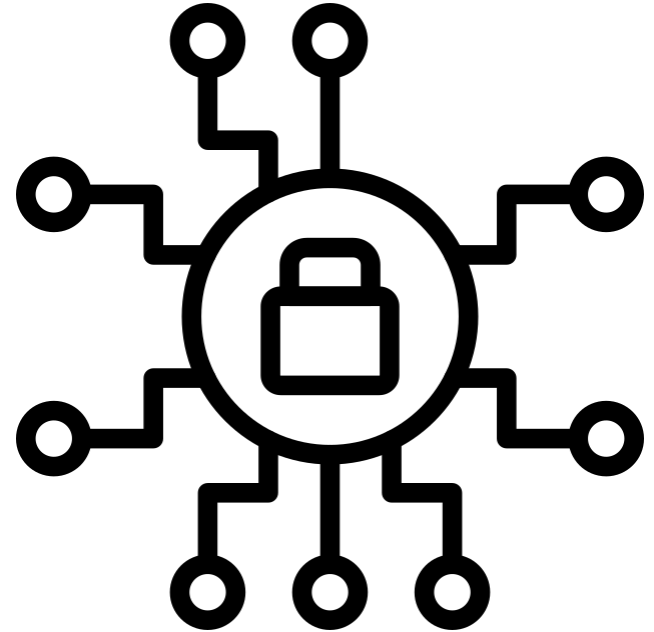
Introduction

Motivation

- Rapid mobile device usage growth around the world

- Mobile users face heightened risks

- Insecure, low-cost devices and limited updates exacerbate vulnerabilities

- Critical need to bridge the cybersecurity awareness gap for these users

Aims & Objective

- Educate users on mobile cybersecurity

- Curate a list of free antivirus and security tools

- Implement multilingual support

- Integrate interactive learning (quizzes) to reinforce cybersecurity practices.

Background

Challenges in Developing Countries

- Low cost mobile devices that are often not equipped with latest update

- Access to updating is limited

- Human factors (low-security awareness) lead to risky online behaviors

- Financial constraints hinder the adoption of robust security solutions

Analysis & Requirements

MoSCoW

- Must-Haves: Essential functionalities for the MVP

- Should-Haves: Enhancements to improve the learning experience

- Could-Haves: Additional features

- Won't-Haves: Excluded features

Functional Requirements

- Must: Display guides, articles, security tools, ensure multilingual support and mobile accessibility

- Should: Implement interactive quizzes with instant feedback

- Could: Allow progress tracking, account creation, search functions, and offline downloads

- Won't: Exclude advanced gamification or reward systems

Non-functional Requirements

- Must: Ensure responsiveness across devices; smooth language switching

- Should: Fast load times, cross-browser compatibility, maintainable code

- Could: Option to develop a mobile app

- Won't: Incorporate gamification elements at this stage

Design

Technologies

- Frontend: HTML, CSS, JavaScript for structure, styling, and interactivity

- Backend: Flask (with Jinja2 and Flask-Babel) chosen for simplicity and familiarity
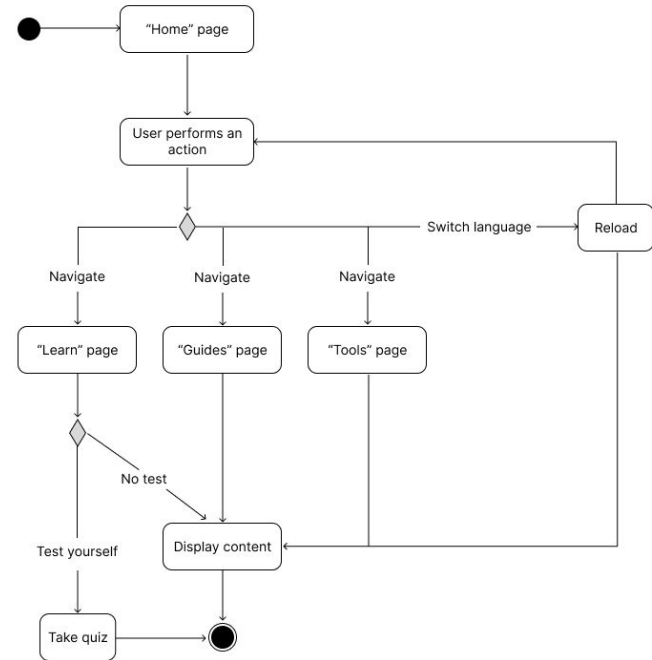
System Architecture

Client-Server Model:

- **Client:** Renders static content and manages interactions (navigation, quizzes)

- **Server:** Serves pre-rendered pages and handles language translation

Diagrams

- Use cases -> show main interactions
-

  Activity diagrams map decision points and user flow through the system

Implementation

Software Development

- Stand up meetings

- Version Control

- Issue Tracking

Project Implementation

- Sourcing for content

- Responsive to various device sizes

- Multilingual support

- Interactive quizzes for each concept

Deployment

- Deployed on Railway to ensure continuous access

- Addressed free-tier hosting limitations

Video Demo

Video demo link:
https://drive.google.com/file/d/1BgtPi63u4gqZ_LsnzfOWnFchxsAkmZoS/view?usp=drive_link

Chapter Summary

Evaluation

Testing

Unit Testing

Verified core functions:
1.   Routing
2.   Language switching
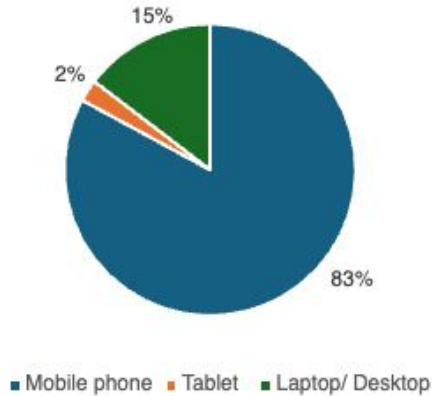3.   Page accessibility

Manual Testing

1.   Conducted cross-device testing
2.   Resolved UI & responsiveness issues
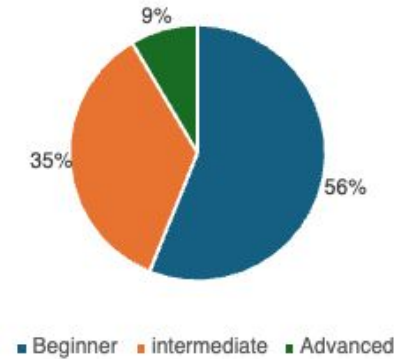
Mini Pilot Evaluation

- Early user testing to gather qualitative feedback

- Refinements based on user observations
  (e.g., navigation improvements)

User Profiles

What device are you currently using?

- 15%
- 2%
- 83%

■ Mobile phone ■ Tablet ■ Laptop/ Desktop

How would you describe your level of experience with cybersecurity?

- 9%
- 35%
- 56%

■ Beginner ■ intermediate ■ Advanced

Task Evaluation Results

- **Task 1: Navigating the Website**

  Visit the homepage and explore the menu. Locate the Guides section and read one of the concepts (e.g., Secure Mobile Devices, Encryption, etc)

  - Ease of finding "Guides" section — **63%** found it easy
  - Clarity of content in concept they read — well rated at **88%**
  - Ease of navigating back to "Home" — **78%** found it easy

Task Evaluation Results

- **Task 2: Changing the website language**

  Use the language switcher to change the website to another available language.

    - Ease of changing language — **81%** found it easy
    - Accuracy of translated content (if fluent) — **79%** rated as accurate
    - **47%** prefers to have more language options
        - Chinese
        - Spanish

Task Evaluation Results

- **Task 3: Taking a Quiz**

  Navigate to one of the quizzes on the website and complete the quiz.

  - Ease of completing quiz — **75%** found it easy
  - Usefulness of quiz summary page – **80%** found it useful

System Usability Score

Users were required to rate 10 statements based on their experiences using the website
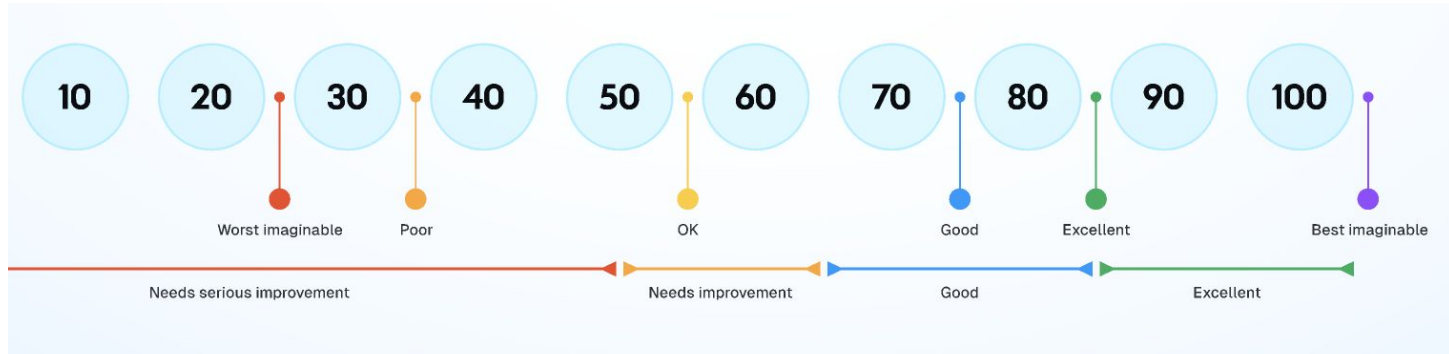
Rating from **1 (Strongly Disagree)** to **5 (Strongly Agree)**

53 responses were used for the System Usability Scale (SUS)

[sum of (odd-number question - 1) + sum of (even-number question - 5)]*2.5

System Usability Score

SUS score: 64.047

Future Work

Future Work

1 **Database Layer**

Potential integration for dynamic content management

2 **User Accounts and Personalised**

Future enhancements for personalised experience to encourage engagement

3 **Mobile App Development**

Allow offline and uninterrupted experience

4 **More Language Support**

Expand the range of supported language to broaden audience