

DEVELOPMENT OF A CYBERSECURITY AWARENESS WEB APP FOR SMALL BUSINESSES

20 November 2025

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University of Wales

Trinity Saint David



Program: BSc Applied Computing

Module: Creativity and Value Creation

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Assignment Title: Innovation & Research

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Ideation & Mind Map

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- ❖ **Mind Map Tool:** I use Microsoft Visio/Word SmartArt for the Mind Meister.
- ❖ **Content:** Creating central idea and following its relative branches.

Self-idea/Core: *Innovation & Creativity in Cybersecurity*

Branches or tree branches: an idea that has a parent-child relationship, extending relative roots from the main ideas.

- ❖ **Topic 1 Concepts:** Design thinking, innovation, value creation, societal impact
- ❖ **Personal Interests:** Cybersecurity, web development, digital literacy
- ❖ **Project Ideas:** Cybersecurity awareness app, Phishing simulation tool, Secure login system using biometrics, and multifactor authentication
- ❖ **Selected Idea:** *Cybersecurity Awareness Web App*, REFERENCE:

Innovation and Creativity – How They Shape the World (Social impact)

- ❖ **Definition of Innovation:** Creation of new ideas, methodologies, or technologies (know-how) to create value and resolve problems.
- ❖ **Creativity:** Producing novel/brand and valuable ideas through imagination and divergent thinking. A single man's imagination can encircle the world. The person who created the pulp has encircled the globe with the power of full beam light today.
- ❖ **Effect on Society:**
 - ✓ Economic development and competitiveness.
 - ✓ Inherits technological evolution and digital transformation, inheriting working in the digital era, and helps to use perfect time management . Example: Generation one computer into the modern world advanced computers today, typically nano technology development that makes you've feel an office at your pocket(Smart mobiles)
 - ✓ Augments personal development and lifelong learning, sharing great knowledge.
- ❖ **New brand Innovation in Computing/Revolution on Tech: [Technopreneur](#)**
 - ✓ AI, Simulated Intelligence(Artificial intelligence) and Machine Learning(syntax).
 - ✓ Internet of Things (IoT).
 - ✓ Blockchain and Cybersecurity which are mostly working in digital market and crypto currency,

Mobile and Cloud Computing

Role of Innovation in Self and Society

❖ Individuals:

- ✓ Problem-solving and adaptability, individually: A problem understanding is a half a problem solved
- ✓ Shapes digital and entrepreneurial skills, which are Technopreneur.
- ✓ Fully gain creative confidence and collaboration that helps to work with different applications. Collaborative tools are an application that helps you to communicate with the help of the program. Example: Online Meeting app

❖ Society:

- ✓ A solution to the public (Share solution) that we can use as a common solution. Microsoft's are a common solution for the societies in the globe. We every individuals are using for the specific purpose.
- ✓ Addressing advanced modern trials like cybersecurity and data privacy.
- ✓ Promote ethical technology use.

The Need for Cybersecurity Awareness in Small Businesses

These following three components are highly depurative needs a cybersecurity Arnesses in a small business.

❖ **Current Issues:**

- ✓ Small businesses are often underprepared for cyber threats.
- ✓ Cumulative phishing, ransomware, and data breach incidents.
- ✓ Limited budgets and lack of trained personnel or insufficient knowledge of cybersecurity.

❖ **Consequences:**

- ✓ Financial loss, reputational damage, and operational downtime.
- ✓ Agreement and legal risks.

❖ **Opportunity for Innovation:**

- ✓ Using mobile applications and gamified learning to raise awareness.
- ✓ Promoting a “security-first” culture.

Branch 4

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Project Idea – Cybersecurity Awareness App for Small Businesses

❖ Concept:

- ✓ Collaborating on Cyber security application training and real-time threat alerts tailored for small businesses using mobile and web-based application
- ✓ Gamified learning modules (phishing simulations, quizzes).
- ✓ Personalised content by industry and risk level.
- ✓ Dashboard for tracking staff progress.
- ✓ Incorporation with AI chatbot for tips and Q&A.

❖ Technological Components:

- ✓ Front-end: Flutter/React Native.
- ✓ Back-end: Firebase or AWS.
- ✓ Security: Encryption, two-factor authentication, or multi factored authentications.

❖ Innovative Aspects:

- ✓ Combines AI, gamification, and education.

User-friendly, low-cost solution for SMEs

Benefits and Impact

❖ For Small Businesses:

- ✓ Enhanced cyber hygiene and staff awareness.
- ✓ Reduced risk of data breaches.
- ✓ Cost-effective compliance support.

❖ For Computing and Society:

- ✓ Indorses accountable technology use.
- ✓ Contributes to safer digital environments.
- ✓ Establishes innovation as a tool for social good.

Branch 6

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References:

[1]

I. N. Dubina and E. G. Carayannis, Eds., *Creativity, Innovation, and Entrepreneurship Across Cultures : Theory and Practices*, 1st ed. 2016. New York, NY: Springer New York, 2016. doi: 10.1007/978-1-4939-3261-0.

[2]

G. I. Seffers, "THE SCIENCE OF CYBERSECURITY," *Signal*, vol. 72, no. 2, pp. 38–39, 2017.

S. Cottrell, *The study skills handbook*, 6th ed. London : Bloomsbury Publishing Plc, 2024, p. 1 online resource (458 pages).

From <<https://whelf-uwtssd.leganto.exlibrisgroup.com/leganto/nui/citation/11107309140002421>>

[3]

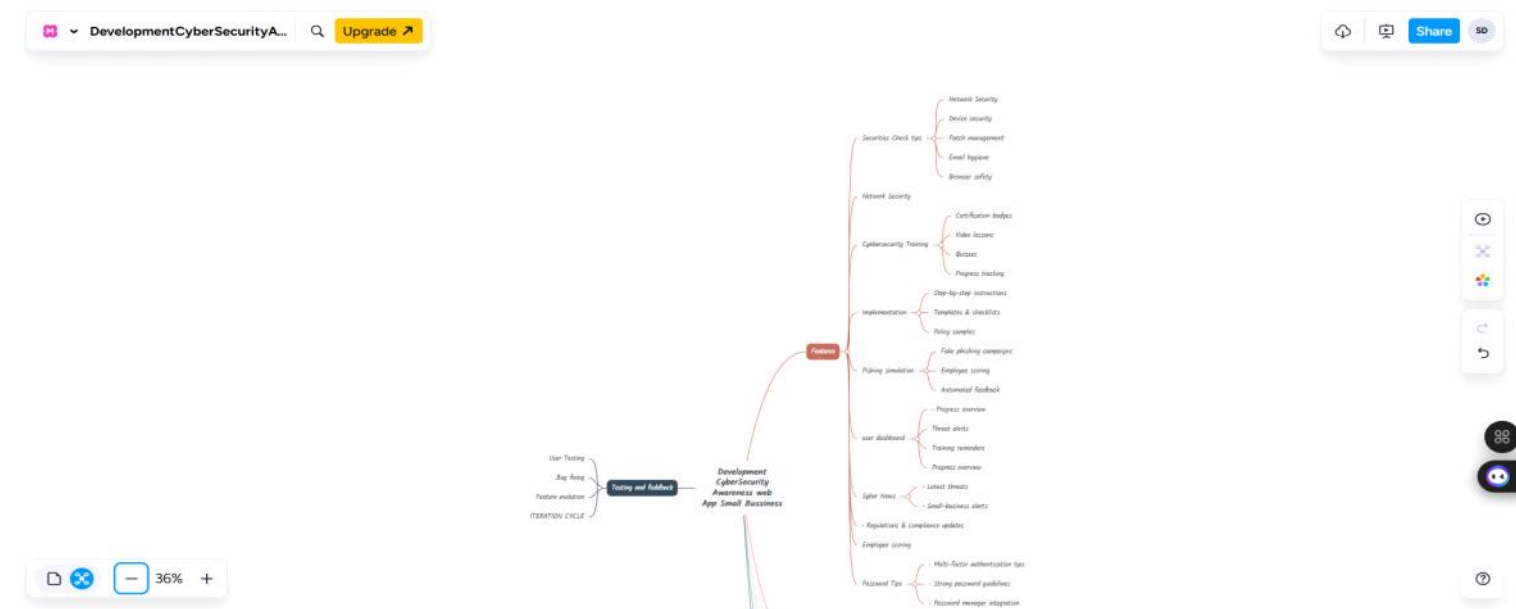
B. Camburn *et al.*, "Computer-aided mind map generation via crowdsourcing and machine learning," *Research in engineering design*, vol. 31, no. 4, pp. 383–409, 2020, doi: 10.1007/s00163-020-00341-w.

How to Create the Mind Map

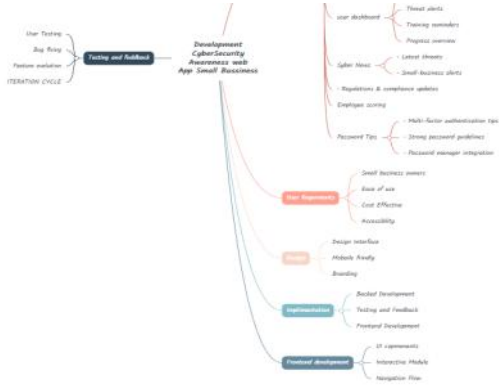
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Mind Map MAIN PART



THE UPPER SUB NODES



THE LOWR SUB NODES

Aim & Objectives and Research Area

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Introduction

The principal aim of this project is to design and develop a **Cybersecurity Awareness Web Application** that authorises **small business owners** to understand, identify, and mitigate cybersecurity threats effectively. Given that small businesses often absence the monetary and technical resources to employ complete-scale cybersecurity teams, this web app seeks to provide an accessible, affordable, and user-friendly platform to augment their cybersecurity posture. The project's goal is to link the information gap in cybersecurity awareness by providing educational modules, imitations, best exercise guidelines, and real-world tools that strengthen users' ability to safeguard their businesses against cyber risks. Ultimately, the app will substitute a culture of cyber vigilance and proactive risk management within the small business ecosystem

Q1. Aim and Objectives

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Aim:

The principal aim of this project is to design and develop a **Cybersecurity Awareness Web Application** that authorises **small business owners** to understand, identify, and mitigate cybersecurity threats effectively. Given that small businesses often absence the monetary and technical resources to employ complete-scale cybersecurity teams, this web app seeks to provide an accessible, affordable, and user-friendly platform to augment their cybersecurity posture. The project's goal is to link the information gap in cybersecurity awareness by providing educational modules, imitations, best exercise guidelines, and real-world tools that strengthen users' ability to safeguard their businesses against cyber risks. Ultimately, the app will substitute a culture of cyber vigilance and proactive risk management within the small business ecosystem

Objectives:

- ❖ Explore current cybersecurity encounters met by small businesses.
- ❖ Examine existing awareness tools and classify gaps in serviceability and effectiveness.
- ❖ Design a prototype app that delivers gamified cybersecurity training modules.
- ❖ Assess user meeting and learning outcomes through usability testing.

Mention best practices for implementing cybersecurity awareness programs in small enterprises

Q2. Research Philosophy

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This project adopts a **pragmatic research philosophy**, which values both qualitative and quantitative methods to produce actionable solutions. Pragmatism focuses on “what works” to address real-world problems .

❖ **Rationale:**

Cybersecurity awareness involves technical, behavioural, and organizational dimensions. A pragmatic approach allows flexibility to combine:

- ✓ **Qualitative research** (e.g., interviews with business owners about security habits).
- ✓ **Quantitative research** (e.g., pre- and post-training surveys to measure awareness).

Outcome:

Generates practical insights for both app design and human behaviour in cybersecurity contexts

Q3. Search Tools and Research Strategy

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Research Databases and Tools:

- ✓ **IEEE Xplore:** Technical research on app development and cybersecurity tools.
- ✓ **ACM Digital Library:** Studies on usability, gamification, and software innovation.
- ✓ **ScienceDirect:** Academic literature on cybersecurity education and human factors.
- ✓ **Google Scholar:** Broad coverage for interdisciplinary references.
- ✓ **NCSC Publications:** Government and industry best-practice guidelines.

Search Strategy:

- ❖ **Keywords:** “cybersecurity awareness app,” “small business cybersecurity,” “gamified learning,” “SME data protection,” “digital security education.”
- ❖ **Boolean Operators:**
 - ❖ (“cybersecurity” AND “small businesses”)
 - ❖ (“awareness app” OR “training tool”)
 - ❖ (“gamification” AND “education”)
- ❖ **Filters:**
 - ❖ Last 5 years (2020–2025).
 - ❖ Peer-reviewed journals and conference proceedings.
- ❖ **Screening:**

Abstracts will be reviewed to ensure relevance to app design, SME needs, and awareness training.
- ❖ **Reference Management:**

Tools like **Zotero** or **Mendeley** will be used for citation management and review organisation.

References

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[1]

D. D. Johnston, *Research methods for everyday life* : blending qualitative and quantitative approaches, First edition. San Francisco, Calif: Jossey-Bass, 2009.

[2]

H. R. Bernard, *Research methods in anthropology* : qualitative and quantitative approaches, 5th ed. Lanham, MD: AltaMira, 2011.

[3]

Sonyel Oflazoglu, *Qualitative versus quantitative research*. Place of publication not identified: IntechOpen, 2017.

Research Strategies: The Impact of Social Media Marketing on Consumer Purchasing Behaviour in the Fashion Industry.

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Effective investigation strategies adopt a planned approach to gather trustworthy information, proving that projects continue to be directed and testimony based. They help detect relevant sources, define an organising system, and direct analysis. Experimental information collection is equally important, as it allows researchers to test tools, improve procedures, and discover potential challenges before full-scale implementation.

Q1. Strategies to Enhance Validity, Reliability, Generalisability, and Ethical Considerations

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Ensuring the validity, reliability, and ethical reliability of the survey is necessary for making reliable findings. Rightfulness concerns how exactly the examination measures its deliberate concepts. This learning will recover validity through triangulation, using both electronic surveys and semi-structured conversations. Survey questions will be ranged with established consumer-behaviour theories, and a pilot test will be conducted to refine any uncertain items.

Reliability will be reinforced by standardised survey apparatuses and consistent data-collection procedures. *Cronbach's alpha* will be calculated to evaluate internal consistency, and smooth instructions will be offered to all respondents.

Generalisability will be reinforced by counting participants of varied ages, genders, and pay levels within the style market. Class-conscious sampling may be used to ensure comparative representation.

Ethical standards will be supported through informed consent, namelessness, and secure data storage. Members' rights will be clearly interconnected, and ethical endorsement will be obtained before data collection.

Q2. Research Strategies and Pilot Data Collection Method

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Dissimilar researchers may use several methodologies: such as onsite observation, questioning, literature review, and field visits: to collect data for system development or developing statics. For this training, a diverse-methods approach will be used to deliver a holistic understanding of social media's encouragement on consumer obtaining behaviour. The quantitative element will encompass an online survey distributed through social media platforms, allowing efficient data collection from a huge and geographically diverse sample. The review will contain closed-ended questions consuming [Likert scales to measure attitudes, motivations, and purchasing frequency](#) prejudiced by social media marketing.

The qualitative element will contain of semi-structured consultations with 10–12 members to discover deeper inspirations and insights behind consumer behaviour. This elastic approach will generate rich, detailed insights that accompaniment patterns pragmatic in the quantitative results.

A pilot study will be showed with 10 participants to test the clarity and significance of the survey objects. Feedback will help classify confusing, unclear, or tiresome questions and refine the instrument. For instance, if the question “How frequently do you purchase style items indorsed by influencers?” is viewed as uncertain, it may be reviewed to specify a timeframe such as “In the past three months...”.

Q3. Types of Quantitative and Qualitative Analysis

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Quantitative analysis will implicate graphical statistics (mean, mode, frequency, standard deviation) to summarise demographic shapes and buying behaviour. Relationship and reversion analysis will inspect relationships between social media experience and purchasing tendencies, using tools such as SPSS or Excel.

Qualitative analysis will use thematic analysis to recognize repeated themes in consultation data, plus social resilient, product trust, and demonstrative connections to influencers. Encrypting and theme expansion will support clarify why certain social media policies are more influential. Joining both analytical approaches will deliver all-inclusive insights into the quantifiable patterns and fundamental motivations driving fashion-related consumer behaviour.

Reference

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[1]

M. P. Patel, *The Impact of Social Media Use on Mental Health of the Adult Population: A Systematic Literature Review*. University of Wales Trinity Saint David, 2024.

[2]

Y. Meng *et al.*, "Social media in epilepsy: A quantitative and qualitative analysis," *Epilepsy & behavior*, vol. 71, no. Pt A, pp. 79–84, 2017, doi: 10.1016/j.yebeh.2017.04.033.

[3]

M. Andreotta *et al.*, "Analyzing social media data: A mixed-methods framework combining computational and qualitative text analysis," *Behavior research methods*, vol. 51, no. 4, pp. 1766–1781, 2019, doi: 10.3758/s13428-019-01202-8.