

Project Proposal

Wednesday, August 13, 2025

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Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Name: Jac Henry Wilde

Student Number: 2405772

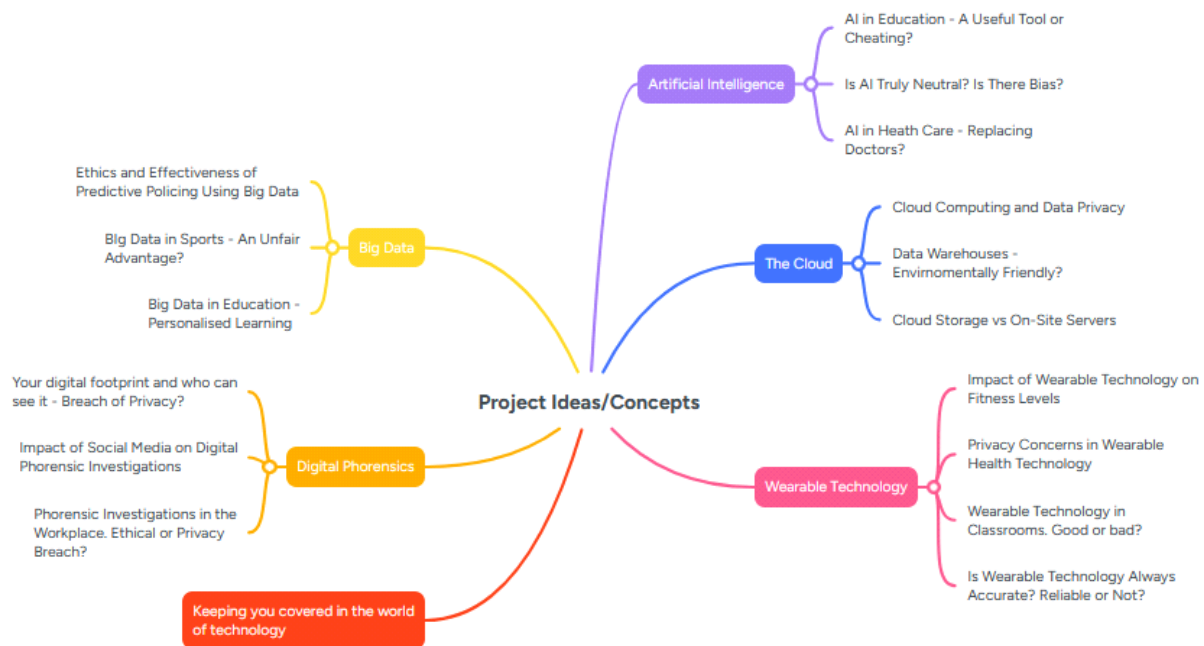
Course: Computer Networks and Cyber Security

Task 1 - Q1 + Q2

Monday, August 11, 2025 8:59 AM

Ideation & Mind Map

Q1: Mind Map



Q2: Mind Map + Project Idea



Chosen Research Project:

Your Digital Footprint and Who Can See It – Breach of Privacy?

The focus here will be to identify where your data is being used, debate the ethics of its use, and discuss the effects on personal privacy and how to improve.

Task 2 - Q1

Monday, August 11, 2025 9:11 AM

Research Title:

Your Digital Footprint and Who Can See It – Breach of Privacy?

- **Q1.** Create and document a single **Aim and several Objectives** for your project.

Aim

To investigate the collection of personal data, debate its ethics, and research strategies of protecting your data.

Objectives

- Analyse the types of data most commonly collected by companies online.
- Evaluate the types of companies that have access to this data.
- Assess the ethical considerations of use of personal data in different contexts (marketing, profiling, etc).
- Research and analyse different methods of reducing digital footprint and protecting personal data.

Task 2 - Q2

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- **Q2.** Identify an appropriate **research philosophy** for your project.

As seen in Unit 1, Topic 2; there are many research philosophies to consider whilst completing a project. The research philosophy that best suits the objectives of this project is 'Pragmatism'. This philosophy only considers concepts relevant if they support an action. Whilst they acknowledge there are many ways of interpreting the world, no single point of view can ever give the entire picture. There may be multiple realities.

This method is relevant to the chosen project as it accepts that there are two sides to the story. Whilst over sharing and misuse of data is clearly a negative, there is the argument for when data is used correctly; personal data can be used to provide personalised experiences to individuals online to show more content they approve of and less content they dislike, giving the individual a more positive experience.

By utilising the research philosophy of pragmatism, the researcher can align their methodologies with real-world examples, enhancing the relevance of the findings [1]. This is especially relevant for the chosen topic, as the digital world is an ever-evolving place where realities can be very different across the internet.

Task 2 - Q3

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- **Q3.** Select and document appropriate **search tools** including some specific **research databases** to identify research related to your project area and use **search strategies** to **identify relevant research** related to your project.

As highlighted by Thompson et al in 'Ethics and governance for internet-based conservation science research' [2]: Internet-based research should always comply with legal standards when sourcing their data, and should only use research databases that do the same.

There is potential for using multiple search tools and databases for this research topic. An online blog by Dr Urvashi Sharma [3] provides some useful suggestions for areas to research. Professional online communities such as LinkedIn is a suggested method. Whilst this could be useful for gaining the perspectives of professionals in the field, other research methods would be required to gain knowledge on the perspective of the general public.

Another suggested method was social media platforms. This would be a useful tool in gathering the opinions of members of the public, however it would be important to consider that the researcher would not know the foundations that these opinions are built upon, meaning they are likely to be inaccurate and not based upon extensive research, as well as being highly subject to bias. Social media platforms do however provide some documentation on the data they collect and how it is used, as well as third party companies they provide this data to. This knowledge would be useful for the project.

Dr Sharma also suggests that open surveys could be a useful method of research. This would provide data in a format that is convenient for analysis, as well as providing large quantities of data from people of ranging backgrounds.

From Unit 1, Topic 3, it is clear that 'Semantic Scholar' would be a useful tool for the research project. It is a specialised search engine design for academic research, that as of 2020 had indexed over 190 million papers. This would be especially useful when researching factual information on data and how it is collected, analysed and used. Another useful research database would be IEEE Xplore. This database specialises in providing access to a wide range of technical literature and documentation relating to the technology industry.

Boolean search strategies would also be an effective tool when gathering research. This is a strategy that employs 'Boolean operators' (AND, OR, NOT) to specify criteria for your search. 'And' is used to link multiple terms, meaning the search must show results that contain the terms specified. 'Or' is used to widen the search by showing results containing any one of the terms provided. 'Not' will restrict the search, forcing it to filter out results that contain the term provided [4].

In addition to these research strategies, the university library houses numerous academic sources related to the topic that would be incredibly useful. Utilisation of this would be helpful towards gaining valuable research.

Task 2 - Reference List

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References

- [1] M. Elgeddawy and M. Abouraia, "Pragmatism as a Research Paradigm," in *European conference on research methodology for business and management studies*, Kidmore End: Academic Conferences International Limited, 2024, pp. 71–74. doi: 10.34190/ecrm.23.1.2444.
- [2] R. M. Thompson, J. Hall, C. Morrison, N. R. Palmer, and D. L. Roberts, "Ethics and governance for internet-based conservation science research," *Conservation biology*, vol. 35, no. 6, pp. 1747–1754, 2021, doi: 10.1111/cobi.13778.
- [3] D. U. Sharma, "16 online sources for research data (mostly free)," Medium, 7 September 2024. [Online]. Available: <https://medium.com/@DrUrvashi.Sharma/15-online-sources-for-research-data-mostly-free-036ae40934d6>. [Accessed 11 08 2025].
- [4] University of Illinois, "Advanced Library Search Strategies," 5 March 2025. [Online]. Available: <https://guides.library.illinois.edu/c.php?g=563215&p=3877584>. [Accessed 11 August 2025].

Task 3 - Q1

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- **Q1.** Consider and document strategies to enhance **validity, reliability, generalisability** and **ethical considerations**.

When conducting primary research it is essential that the treatment of participants remains ethical. The researcher must adhere to ethical standards governing behaviour and data collection & handling [1].

Generalisability is how applicable research results are to a larger context [2] It is important to select a large enough sample size, to ensure the data gathered is transferrable to the entire population. In addition to this, it is important to choose a sampling method that gives a fair representation to all sub-groups within the population. It is also crucial to develop a precise population. A clearly defined population, makes selecting samples and easier process. When selecting samples, there are numerous methods to choose from. The two main methods are 'probability' and 'non-probability'. Probability being completely random (used in quantitative), and non-probability being non-random (used in qualitative). These methods will improve the generalisability of the data the researcher collects.

To ensure data collected is reliable and valid, there are various factors the researcher must consider. When conducting qualitative research the following factors will effect validity: Researcher bias, the design of research tools and sample selection. The factors change slightly when completing quantitative research. These factors include: Appropriate analysis of the data, the design of research tools, sample selection and sample size. Handling these factors appropriately will ensure the validity of the research [3]. To ensure the reliability of the data, the researcher must carry out all experiments in the same way for each participant. It is also important to obtain internal validity to establish causality, and external validity to generalise the results to other settings.

When researching secondary data, it is important to utilise the 'CRAAP' method. This is an abbreviation that stands for: currency, relevance, authority, accuracy, purpose. When utilising the research of others, it is essential to take these aspects into account to ensure the data used is valid and reliable.

Task 3 - Q2

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- **Q2.** Select research strategies/**data collection methods** you would use to collect data for your project. And design a **pilot data collection** method appropriate for your project and acquire some feedback to improve the focus of your project (include in an appendix section/page and refer to in the main body of the proposal).

The following research strategies and data collection methods could be used for the project 'Your Digital Footprint and Who Can See It – Breach of Privacy?'

- Online Survey
 - Surveys will be conducted to investigate individual interpretations of data collection and general knowledge on the topic, as well as opinions on how data should be used and the ethical boundaries it has. This would be beneficial as online surveys can reach a wide audience quickly, gaining almost immediate responses. Some of the data will also be useful for statistical analysis. Appendix A shows the design of a pilot survey that could be distributed. Feedback should also be received from the pilot group.
- Structured Observations
 - These observations will be used in various settings with different demographics to gather an understanding of how different people protect their data. Various acts such as accepting or declining cookies, use of passwords and multi factor authentication, posting online publicly, use of Virtual Private Networks (VPNs) are all noteworthy acts. These observations would be taken ethically, with permission where required. Appendix B shows a pilot observation sheet that could be used. Feedback from peers could be taken and acknowledged for this.
- Secondary Research
 - Secondary research would also be completed for the project. Academic literature, industry reports, legislation, and reputable news sources could be reviewed to establish the scope of digital data collection, as well as ethical debates, and best practice recommendations.

Task 3 - Q3

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- **Q3.** Outline some different types of **quantitative and qualitative analysis**.

Descriptive Statistical Analysis

Descriptive statistical analysis plays a crucial role in the analysis of quantitative data. It includes measures of central tendency, such as mean, median, and mode, which help to identify the typical values within the data. In addition to this, calculations such as range, variance, and standard deviation are used to provide further insight for analysis [4]. In order to accurately interpret their findings, researchers must use descriptive statistics effectively [5]. This includes the use of suitable, yet effective, graphs, charts and tables.

Thematic Analysis

For the analysis of qualitative data, a useful technique is thematic analysis. This offers researchers a more flexible approach to understanding more complex information. There are six key steps to completing thematic analysis: understanding the data, generating codes, bringing codes into themes, refining themes, naming themes and writing about the themes [6]. Part of thematic analysis is to create a themes analysis table (see appendix C for example). When created in MS Excel or other spreadsheet applications, it can be sorted to arrange the data in convenient ways for analysis. Allowing you to examine frequency of certain themes and codes.

Task 3 - Reference List

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- [1] Leila Dobakhti, "The Process of Enhancing Validity, Reliability, and Ethics in Research," *Iranian Journal of Applied Language Studies*, vol. 12, no. 2, pp. 59–88, 2020, doi: 10.22111/ijals.2020.5978.
- [2] K. Nikolopoulou, "What Is Generalisability? | Definition & Examples," Scribbr, 3 March 2023. [Online]. Available: <https://www.scribbr.co.uk/bias-in-research/generalisability/>. [Accessed 12 August 2025].
- [3] MESH Guides, "How can validity and reliability be improved?," MESHGuides, Publish date unknown. [Online]. Available: <https://www.meshguides.org/guides/node/450>. [Accessed 12 August 2025].
- [4] P. Mishra, C. Pandey, U. Singh, A. Gupta, C. Sahu, and A. Keshri, "Descriptive statistics and normality tests for statistical data," *Annals of cardiac anaesthesia*, vol. 22, no. 1, pp. 67–72, 2019, doi: 10.4103/aca.ACA_157_18.
- [5] D. Giuliani, M. M. Dickson, G. Espa, and Dr Roberto Poli, "Teaching statistics in the context of social foresight. An applied approach based on the use of an open-source software," *On the horizon*, vol. 23, no. 2, pp. 140–148, 2015, doi: 10.1108/OTH-02-2015-0010.
- [6] H. Nolan-Cody, K. E. Phillips, and K. M. Scharp, "Thematic analysis and thematic co-occurrence analysis: Teaching students to conduct qualitative research with depth," *Communication teacher*, vol. 38, no. 4, pp. 299–307, 2024, doi: 10.1080/17404622.2024.2370452.

Appendices

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Appendix

A) Pilot Survey

Awareness & Basic Behaviour

1. Have you heard the term “digital footprint”?
☐ Yes ☐ No
2. How often do you review privacy settings on your main online accounts?
☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always
3. Which devices do you use daily? (tick all that apply)
☐ Smartphone ☐ Laptop ☐ Tablet ☐ Desktop PC ☐ Smart speaker / IoT device

Privacy Practices

4. In the last month, have you changed privacy or tracking settings on any account?
☐ Yes ☐ No ☐ Don't remember
5. Which of the following privacy tools have you used in the last 6 months? (tick all that apply)
☐ Private/incognito browsing ☐ Ad blocker ☐ VPN ☐ Tracker-blocking browser extension ☐ Password manager ☐ None
6. When confronted with cookie/consent banners, my typical action is:
☐ Accept all/default ☐ Customise settings ☐ Reject non-essential ☐ Ignore / close without reading

Attitudes and Ethics (Likert Scale 1= Strongly Disagree – 5= Strongly agree)

7. Companies should obtain explicit consent before collecting behavioural data about me. 1 2 3 4 5
8. Targeted advertising based on my online activity is an acceptable practice. 1 2 3 4 5
9. I feel adequately informed about how my online data is used. 1 2 3 4 5

Experience

10. Have you ever experienced a privacy incident (e.g., unwanted contact, targeted scam, surprise data sharing)? ☐ Yes ☐ No
If yes, please briefly describe (1–2 sentences): _____
11. What would make you more likely to manage privacy settings more often? (short answer)

Demographic

12. Age: ☐ 18–24 ☐ 25–34 ☐ 35–44 ☐ 45–54 ☐ 55+
13. Occupation / student / other : _____

B) Pilot Observation Sheet

Item No.	Behaviour Observed	Yes	No	Frequency / Rating (1–5)	Notes / Examples
1.	Adjusting Privacy Settings				
2.	Rejecting Cookies/tracking				
3.	Using Privacy Tools(VPN, Incognito, etc)				
4.	Sharing personal content publicly (social media)				
5.	Locking screen, logging out after use				

6.	Discussing privacy or data concerns				
7.	Ignoring privacy/security prompts				
8.	Other noteworthy activity				

C) Themes Table

Author	Note	Theme	Code
Name of interviewee	An interesting quote from interview transcript	Named theme that fits	A code that the researcher assigns

D) Proof of participation in module activities

Changemakers

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+ Add section + Add page

Unit 1 Topic 1

Unit 2 Topic 2

Unit 3 Topic 3

Unit 4 Topic 4

Business Idea

Section 1

Reflect:

Reflect

You have come to university to study a particular subject, but what is the **area of interest** that has caused you to take time to study this?

Enter your answer into the box below. You will revisit this later.

Digital Forensics

Making Research interesting:

Consider your readers – target a particular aspect of knowledge that can trigger an interesting debate

Keep it brief – less is more.

Check

Question 1 of 3

Which of these are good research questions?

Read each set of questions as they appear below and select which you feel is the best research question of the two.

What effect does the pandemic have on people's minds?

What effect has the isolation of young adults had on their mental health?

Check

Question 2 of 3

Read each set of questions as they appear below and select which you feel is the best research question of the two.

What factors led to homosexuality being legalised in the UK in 1967?

How do Welsh rugby fans relate to the LGBTQ+ movement since Gareth Thomas announced that he was gay?

Check

Question 3 of 3

Read each set of questions as they appear below and select which you feel is the best research question of the two.

Correct!

A is not specific enough. What effect? What people? Which pandemic? You can see with question B that data can be collected from primary and secondary sources and that the targets are clearly defined.

Not quite...

A is too broad and has probably been researched already. B identifies an underexplored aspect of the topic that requires investigation.

Correct!

A is too simplistic, asking for a straightforward fact that can be easily found online. B is complex and a comparative question that requires a



To summarise. The key points to formulating your hypothesis is (Select each of the checkboxes to reveal key elements):

Use these approaches in an order that you think is appropriate for your study. **Apply** what you have learnt in this section to **phrase a hypothesis** on your chosen subject.

Digital Forensics in Mobile Devices: Privacy vs Public Safety.

H1: If devices must have back doors for law enforcement, then overall device security and public support is weakened.

H2: Mobile device encryption significantly hampers forensic investigations into criminal activity.