Part 1 – E-Portfolio Content Summary

1. Overview

This e-Portfolio documents my academic and professional development throughout the *Research Methods in Computing* module. Across ten units, I explored the foundations of academic research, ethics, data analysis, and reflective practice. My chosen research topic—*Use of Information Systems (IS) to Transform Small Businesses in Indonesia*—served as a central thread linking the literature review, proposal, and analytical assignments.

The portfolio captures three integrated strands of learning:

1. Research methods and critical inquiry, developed through literature review and proposal tasks.
2. Data analysis and quantitative reasoning, demonstrated through Excel-based statistical exercises.
3. Ethical and professional awareness, explored via case studies and reflections on AI governance and data integrity.

Together, these elements evidence the learning outcomes of the module: critical evaluation of existing literature, application of research design and analysis methods, and appreciation of professional, legal, social, and ethical issues in computing.

Throughout the process, I learned that effective research in computing extends beyond technical knowledge. It requires ethical mindfulness, methodological accuracy, and awareness of broader social implications. Each unit built upon the previous, fostering an iterative cycle of inquiry, critique, and self-assessment that mirrors professional research practice.

2. Unit 1–5 Reflections: Foundations of Research and Ethics

The early units introduced the conceptual basis for research and ethical responsibility in computing.

- Unit 1 required a reflection on *global AI governance* (Correa et al., 2023; Deckard, 2023), exploring how countries define values for ethical AI. This task deepened my understanding of cultural and political variations in technology governance and emphasised the need for transparency and accountability.
- Unit 3 examined *research methods and data collection*. I reflected on how qualitative interviews and quantitative surveys can complement each other—an idea later adopted in my SME project design.
- Unit 5, *Case Study: Inappropriate Use of Surveys*, analysed the *Cambridge Analytica* scandal (Confessore, 2018). By examining this case, I recognised how

data misuse can breach privacy, undermine trust, and distort democratic processes.

The gradual introduction of ethical and methodological principles shaped my critical awareness. I realised that every stage of research — from question formulation to data dissemination — carries ethical implications. This shift in mindset encouraged me to approach later tasks not just as academic exercises, but as professional responsibilities.

3. Unit 2 and 7 – Literature Review and Research Proposal Planning

My topic choice, *Use of Information Systems to Transform Small Businesses in Indonesia*, emerged from an interest in digital transformation and socioeconomic development. SMEs account for over 90 percent of Indonesian enterprises yet face technological barriers. The literature review (Unit 7) synthesised studies such as:

- Ardiansah et al. (2024) – quantitative analysis of IS adoption in Central Java.
- Wiweko and Anggara (2025) – exploration of digital platform ecosystems.
- Tambunan and Busnetti (2024) – national survey on SME digital readiness.
- Ghobakhloo and Iranmanesh (2021) – discussion of IS competitiveness within Industry 4.0.

Key findings indicated that infrastructure, cost, and digital literacy remain major challenges. My objectives were:

1. Evaluate IS adoption models for SMEs.
2. Identify technological and cultural barriers in Indonesia.
3. Analyse links between IS integration and SME transformation.

The process of writing the literature review strengthened my analytical reading and synthesis skills. Initially, I tended to summarise rather than evaluate sources, but feedback guided me to move toward critical comparison—examining assumptions, gaps, and methodological limitations. For instance, I noted that many studies treated "digital adoption" as purely technical, overlooking human and cultural dynamics such as leadership support or employee training. Recognising this gap motivated my mixed-methods approach in the proposal.

The research proposal (Unit 10) transformed the review into a concrete plan. It outlined a mixed-methods design combining online surveys (quantitative) and semi-structured interviews (qualitative). Quantitative data would be analysed using descriptive statistics and regression (SPSS), while qualitative data would be coded thematically

(NVivo). Ethical protocols were also included—such as informed consent, confidentiality, and data storage security.

The shift from literature review to proposal was an important learning milestone. It taught me how theory becomes actionable through research design. Feedback from tutors emphasised improving conceptual grounding and variable definition, leading me to integrate established theories like the Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI). This not only strengthened the rigour of my design but also prepared me for future empirical work.

4. Units 6–9 – Statistical Analysis and Interpretation

These units focused on quantitative reasoning and data interpretation using Excel.

Unit 6 – Summary Measures:
I learned to calculate mean, median, standard deviation, and inter-quartile ranges using COUNT, AVERAGE, STDEV, and QUARTILE functions. Comparing Diet A and Diet B datasets demonstrated how summary statistics can reveal trends in effectiveness and variability.

Unit 7 – Hypothesis Testing:
Exercises using *paired* and *independent samples t-tests* deepened my understanding of null and alternative hypotheses, significance levels, and p-values. I also examined the assumptions underpinning t-tests (normality and equal variance). This provided practical insight into inferential logic and strengthened my ability to evaluate research results in academic papers.

Unit 8 – Inference:
Here, I studied the principles of hypothesis formulation, significance, and errors (Type I/II). The legal analogy—presumption of innocence—helped conceptualise null hypothesis testing. I learned to interpret p-values correctly and avoid common misconceptions about "proving" hypotheses.

Unit 9 – Data Visualisation:
I constructed bar charts and histograms to represent brand preferences, heather species distribution and weight-loss distributions. Understanding how class intervals and relative frequencies shape histogram interpretation helped me appreciate data visualisation as a communication tool, not just computation.

These exercises transformed my understanding of quantitative analysis from procedural to conceptual. I no longer see statistics as isolated formulas but as a storytelling mechanism that supports transparency and credibility. I also recognised the importance of replicability — ensuring that others can reproduce and verify results. This

mindset will be valuable in any data governance or audit-related work I pursue professionally.

5. Unit 7 Ethical Case Study – Abi and Data Integrity

The *Abi* case explored data falsification and selective reporting. Analysing it through the **ACM (2018)** and **BCS (2022)** codes reinforced that honesty and transparency are fundamental to professional conduct. Misrepresentation of data could lead to legal and reputational consequences, especially in contexts like product safety or AI outputs.

This task was particularly impactful because it connected ethics with real-world pressures. I realised that data professionals often face dilemmas between organisational expectations and ethical obligations. The case reinforced that ethical courage — the ability to report truthfully despite external pressures — is a vital professional skill. I have since reflected on how this principle applies to IT risk auditing, where transparency in control findings is paramount.

6. Evaluation of My Research Submissions

Literature Review Evaluation:
My literature review achieved a *merit* grade (62 %). Feedback indicated a need for stronger narrative coherence and a more comprehensive range of peer-reviewed sources. In retrospect, I recognise that while the paper demonstrated understanding, it lacked depth in theoretical synthesis. Addressing this required refining my literature-search strategy and using frameworks to connect disparate studies.

Research Proposal Evaluation:
The proposal presentation was a significant improvement. It showcased a coherent design, ethical considerations, and anticipated data analysis. Using feedback from the earlier submission, I improved clarity in aims, research questions, and expected outcomes. This progression reflects my growth in academic writing, presentation, and methodological awareness.

Comparing both submissions showed my academic growth: from descriptive synthesis to analytical reasoning. It also illustrated the value of feedback as a tool for iterative learning rather than criticism.

7. Professional Skills Development

Through the module, I completed a professional skills matrix and informal SWOT analysis, identifying core strengths and development needs:

Strengths	Weaknesses	Opportunities	Threats
Ethical awareness and integrity	Limited experience in advanced analytics tools	Expansion into Python/R data analysis	Rapidly evolving tech landscape
Academic writing and referencing	Occasional difficulty linking theory to practice	Collaboration in digital transformation projects	Time constraints balancing work and study
Cross-cultural insight into digital adoption	Confidence in oral presentations still developing	Engagement in global SME digital initiatives	Information overload and AI misuse risks

Completing this reflection was revealing. It encouraged me to connect academic learning with employability goals. I recognised that mastering ethical reasoning and analytical interpretation enhances not only research ability but also professional credibility in roles like IT auditing or risk management.

8. Developing the e-Portfolio on GitHub

Creating my e-Portfolio on GitHub was both a technical and reflective learning experience. Since I had not previously used GitHub for academic purposes, I had to familiarise myself with its repository structure, Markdown formatting, and version control features. At first, I found it challenging to organise various documents, such as research papers, statistical exercises, and reflections, into a clear and cohesive layout. Over time, I realised that GitHub's tracking and versioning functions mirrored professional practices in IT documentation, where clarity and accountability are essential.

Overall, building the e-Portfolio helped me integrate technical and reflective skills in a practical way. It became more than a submission platform—it evolved into a personal learning record that showcases my academic development and critical thinking. I now see it as a valuable professional tool that I can continue to update to demonstrate my growth and expertise in computing and research.

The e-Portfolio can be accessed through the following link:
https://github.com/starspace-lab/Research-Methods-and-Professional-Practice.git

Part 2 – Final Reflective Piece

WHAT – Overview of My Learning Journey

Throughout this module I have gained a comprehensive understanding of how ethics, research, and data analytics combine to shape professional practice in computing. The course began with topics such as professional codes of ethics and concluded with research design and statistical application. Activities like the *Case Study on Accuracy of Information* (Unit 7) helped me explore integrity in data reporting, while the Excel-based statistical exercises in Units 7–9 strengthened my ability to test hypotheses, interpret p-values, and visualise data effectively.

Developing my *Social Engineering in Indonesia* research proposal linked ethical reasoning with methodological design. Conducting a literature review trained me to evaluate the quality and bias of sources and to justify research choices transparently. Maintaining my e-Portfolio on GitHub provided a tangible record of growth: each reflection, dataset, and analysis demonstrated how theoretical understanding evolved into practical competence.

SO WHAT – Analysis and Interpretation

Ethical and Professional Awareness
At the start of the module, I saw ethics mainly as compliance. Analysing the *Abi case* changed that perspective. Comparing the *ACM Code of Ethics* (2018) and *BCS Code of Conduct* (2022) revealed that ethical behaviour involves active honesty and accountability, not just adherence to rules. I learned that selective data presentation can mislead stakeholders and even constitute misconduct under consumer or research-integrity laws. This awareness reshaped how I communicate findings—always ensuring accuracy and contextual transparency.

Statistical and Analytical Skills
Before this course, my quantitative knowledge was limited. Conducting paired-sample and independent-sample t-tests gave me practical insight into comparing group means and evaluating significance. Visualising results through bar charts and histograms improved my ability to present information clearly. I also learned that statistical rigour supports ethical decision-making: testing assumptions such as normality and variance equality guards against unintentional bias. These exercises built confidence to interpret data critically rather than mechanically.

Research Literacy and Critical Thinking
Preparing the literature review and proposal refined my ability to critique and synthesise information. I became more selective with academic sources and learned to structure arguments supported by evidence. Tutor feedback guided me to sharpen my methodology and ensure consistency between research aims and methods. I realised that research is iterative and collaborative—its credibility depends on transparency and ethical reasoning at every stage.

Technical Integration and Reflection through GitHub
Compiling the portfolio on GitHub encouraged me to merge technical and reflective learning. Managing files, tracking revisions, and structuring content taught me practical version-control skills. Presenting my work in an organised digital format mirrored professional reporting practices and helped me visualise progress across units.

Personal Development and Emotional Growth
Emotionally, this module was challenging yet rewarding. At times I felt overwhelmed by statistical formulas and citation rules, but gradual practice and feedback reduced anxiety. I learned to accept uncertainty as part of learning and to view reflection as a strength rather than self-criticism. This shift fostered resilience, confidence, and a proactive approach to continuous improvement.

NOW WHAT – Application and Future Development

Applying Ethical and Research Principles Professionally
Going forward, I plan to apply these ethical and analytical principles within IT risk and audit roles. Understanding professional codes ensures I can assess system controls and data accuracy responsibly. The Abi case taught me how to navigate conflicts between business expectations and professional duty—an essential skill in governance and compliance contexts.

Developing Advanced Analytical Competence
I intend to expand beyond Excel to tools such as Python or R for advanced data analytics. Building on the foundation of hypothesis testing and visualisation learned here, I want to conduct larger-scale analyses that can support decision-making in cybersecurity and IT audit engagements.

Sustaining Reflective and Lifelong Learning
Reflection has become a personal framework for professional growth. I will maintain my GitHub e-Portfolio as a dynamic record of learning, documenting new certifications, projects, and reflections. Using Rolfe et al.'s (2001) structure will continue to guide my evaluation of new experiences, ensuring that each challenge contributes to skill development.

Personal and Professional Impact

This module has reshaped how I define professionalism in computing. I now see integrity, analytical precision, and reflection as interconnected qualities that underpin credibility and trust. The combination of technical and ethical growth equips me to make evidence-based, transparent decisions and to mentor others in responsible data handling. In future team projects, I intend to apply reflective review processes to encourage shared accountability and continuous improvement.

Conclusion

Reflecting on the entire journey, I recognise how each component—ethical frameworks, data analytics, and research methods—contributed to a cohesive understanding of responsible computing. The course transformed my approach from task-completion to critical inquiry and ethical awareness. I now view research and analysis not as isolated academic exercises but as practices that shape real-world trust and professional reputation. This reflective process has reinforced my commitment to lifelong learning and to applying integrity and rigour in every stage of professional practice.

This Final submission can be accessed through the following link in the 'Unit-12---Final-Submission' branch: https://github.com/starspace-lab/Research-Methods-and-Professional-Practice.git

References

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