Dissertation Project Marking Review – 2023-24

Introduction

The following document is designed to give an overview of the common mistakes made by students in 2023-24.

It should be noted that achieving the highest grades in the dissertation projects is exceptionally challenging (approximately 9% of submissions achieved A-band grades in 2023-24), and if you aspire to achieve the top grades, the following notes should be reviewed, digested, and applied.

Summary of Common Feedback Statements

Compiled Feedback Report on Dissertation Projects

1. Viva Presentation

Development demoed well but lacked code walk-through or explanation, and the viva was more of a user guide [2].

Viva was more of a user guide, not a practical walkthrough or demonstration of understanding [1].

2. Literature Review

No real research or referencing, only a table with some articles [3].

A table with 2 journals listed, not a comprehensive literature review [1].

No literature review, just a standard table titled “Example academic review” [2].

3. Methodology

Limited requirements elicitation, assumptions made instead [2].

Used waterfall methodology but without citation, and vague interviews [2].

Mostly user requirements elicitation, with no real insight from interviews [1].

Methodology vague with questionnaire and ‘other techniques’ [1].

General and vague data collection methodology, poorly focused questionnaire design [1].

4. Testing and Evaluation

No testing or evaluation at all [4].

No functional testing and lacks evaluation to meet requirements [2].

Little testing and conclusions are brief and subjective [1].

Test plan comprehensive, but conclusions were brief [1].

5. Academic Underpinning

Limited design, no academic underpinning, and predominantly used templates [3].

No citations or academic underpinning, despite using waterfall methodology [2].

Lacked appropriate academic references and underpinning, with no real analysis [2].

Lacked academic trimmings, with no actual references [3].

Missed the opportunity for academic insights and the rationale was unsupported [2].

Lacked appropriate academic rationale and justification [1].

6. Project Objectives and Scope

Overly simplistic, small-scale solution without clear objectives [2].

Objectives were simple but lacked final evaluation [1].

Aims and objectives were more like a task list rather than dissertation drivers [2].

Objectives were more project stages, not drivers for the dissertation [1].

7. Design and Development

Limited design, overly simplistic e-commerce solution [3].

Spent more time on development without full evaluation of requirements [1].

Data structure issues and redundant data in the development process [2].

Well-executed development but with poor academic structure [2].

Built a standard e-commerce website without addressing underlying problems [1].

Comprehensive project development but lacked sound principles and academic foundation [1].

NOTE: [x] indicates the number of mentions in the collated feedback.

Generic Advice to Address Common Issues in Dissertation Projects

To overcome the criticisms noted above, the following advice is provided, along with some examples to be provided in the subsequent sections.

1. Viva Presentation

Ensure Comprehensive Demonstration: Include some walkthrough of your key code sections, an outline of the development process, and content to demonstrate a clear understanding of your work.

Structured Presentation: Organise your viva with a clear beginning, middle, and end. Highlight aims and objectives, methodologies, findings and conclusions.

Show Impact: Clearly demonstrate the impact of your project, including how it meets user requirements and addresses the identified problem.

2. Literature Review

Conduct Thorough Research: Include a comprehensive literature review with critical analysis of existing studies and their relevance to your project.

Proper Referencing: Use proper academic referencing and citation throughout your work to support your arguments and provide credibility.

Analyse, Don't Just Describe: Move beyond listing resources. Critically analyse and compare them to establish the academic context of your project.

3. Methodology

Clearly Define Methodologies: Choose and clearly define an appropriate methodology for your project. Cite relevant sources to justify your choice.

Detailed Requirements Elicitation: Conduct detailed and well-documented requirements elicitation from multiple stakeholders to ensure your project addresses real needs.

Structured Interviews and Surveys: Design structured interviews and surveys that are focused and tailored to gather specific data needed for your project.

4. Testing and Evaluation

Comprehensive Testing Plan: Develop and execute a comprehensive testing plan. Include functional, user, and system testing to validate your project.

Document Testing Results: Clearly document the results of your testing, including any issues found and how they were resolved.

Final Evaluation: Provide a final evaluation of your project, assessing whether it meets its objectives and requirements.

5. Academic Underpinning

Integrate Academic Theories: Integrate relevant academic theories and frameworks into your project to provide a strong academic foundation.

Cite Academic Sources: Regularly cite academic sources to support your arguments and provide a theoretical basis for your work.

Critical Analysis: Provide critical analysis and justification for your choices throughout the project, from design to implementation.

6. Project Objectives and Scope

Define Clear Objectives: Clearly define your project objectives. Ensure they are specific, measurable, achievable, relevant, and time-bound (SMART).

Align Objectives with Academic Goals: Align your project objectives with academic goals to ensure they drive the dissertation and contribute to academic knowledge.

Maintain Focus: Keep your project focused on solving the identified problem, avoiding scope creep and unrelated features.

7. Design and Development

Innovative and Challenging Solutions: Aim for innovative and challenging solutions that demonstrate a high level of technical skill and creativity.

Document Design Process: Thoroughly document your design process, including decisions made, alternatives considered, and justifications.

Adhere to Best Practices: Follow best practices in software development, including proper database design, efficient coding, and thorough documentation.

Practical Examples

The following section will highlight some examples of submitted work and suggest some improvements.

1) Improving the Introduction

Enclosed are two examples of introductory sections. The first version for the Awochem project, followed by a revised version. Although the original version is considered to be good, the revised version adds additional content, including a more detailed outline of the methodology utilised, methodology selection justification and an alternative methodology review.

**********Introduction – Original Version **********

INTRODUCTION

1.1 PROJECT BACKGROUND

Awochem is a focused business with its headquarters in Nigeria that produces polyethylene products. However, despite its dedication to quality, Awochem confronts a major obstacle brought on by its current operational style. For processing orders, keeping track of production operations, and processing payments, this system mainly depends on conventional, paper-based clerical methods. Unfortunately, this out-of-date approach has significantly reduced operational effectiveness, making it difficult for Awochem to reach its full potential for growth and expansion.

It is impossible to exaggerate the importance of efficiency and flexibility in the highly competitive environment of polyethylene product manufacture. Awochem understands that adopting new technologies is essential to being competitive and attaining long-term success. To achieve this, the business has initiated a transformational effort aimed at incorporating technology into every aspect of its operation.

The construction of an automated system, which will transform Awochem's operations, lies at the heart of this project. This complete system will improve inventory control, provide stricter monitoring of production procedures, and expedite the handling of client orders. The system's user-friendly interface has the potential to greatly increase operational transparency, reduce mistakes, and foster smooth interactions between staff and clients.

The project will leverage tools like Node with express, React, firebase, material UI and tailwind technologies to achieve these objectives. In its efforts to modernise its business practises and realise its full development potential in the manufacture of polyethylene products.

In conclusion, Awochem's desire for efficiency and innovation necessitates a change in its operating methods. In addition to improving its operations and client contacts, Awochem aims to ensure sustainable development and expansion in the competitive market of producing polyethylene products by adopting technology and automation.

The rationale for this project is rooted in the following key points:

PROJECT RATIONALE	DESCRIPTION
Business Overview	Awochem is a dedicated enterprise located in Nigeria, specializing in polyethylene product manufacturing. Its dedication to quality is hindered by outdated operating practises.
Existing Inefficiencies	The organization's current operating style is traditional and paper-based, which results in inefficiencies. These inefficiencies take many different forms, such as the disappearance of crucial papers, a delay in receiving client orders, and problems with payment processing. These difficulties have hampered the effectiveness of Awochem's commercial activities.

Need for Automation	The limitations of Awochem's business methods highlight how essential technological integration is. An integrated system is necessary to manage the end-to-end order process—from customers to production and back to clients—as well as a simplified payment system. It is also necessary to highlight Awochem's relevance, recruiting businesses and individuals.
Project Objective	The goal of this project is to develop and put in place a reliable system that fully handles the different operational issues that Awochem faces. Through this project, the goal is to provide a seamless and user-friendly platform that improves the efficacy and efficiency of all crucial organisational activities, ultimately resulting in increased productivity and satisfaction for clients.
Key Focus Areas	The project's goal is to improve these four crucial areas: improving inventory management with real-time tracking, precise control, and effective restocking; streamlining production processes for reduced downtime and errors; revolutionising client order management for quick processing and improved client communication; and putting in place a reliable payment system for seamless and secure transactions.
Benefits of Automation	For Awochem, automation is anticipated to bring about several important benefits, including increased operational effectiveness, reduced error rates, and improved communication with stakeholders. Automation is expected to improve interactions across the organisation by streamlining procedures, reducing errors, and encouraging more seamless interactions.
Most Viable Products	The project will be divided into three distinct stages to deliver progressively valuable features: **MVP1 - Core Functionalities:** This initial phase will focus on essential functionalities, including enabling customers to place

	orders, automating order acknowledgment emails, efficient raw material management aligned with order demands, and establishing a web presence to showcase the company's products and contact information. **MVP2 - Online Payment Integration & Real Time Chat System:** Expanding on the foundational features, this second phase of the project will introduce an online payment system to streamline and accelerate customer transactions, ensuring a smooth and efficient checkout process. Additionally, a real-time chat system will be implemented to enhance customer support, allowing for immediate communication and assistance, thereby improving overall user engagement and satisfaction. **MVP3 - AI Integration for Chat and Personalization:** In the final phase of the project introduces an advanced AI system, which includes a sophisticated chatbot feature. This system will not only analyse customer ordering patterns to provide personalized product recommendations but will also enhance interaction through the chatbot. This dual approach elevates the ordering experience by offering tailored suggestions and responsive communication, significantly boosting customer satisfaction.

Table 1.1 1 - Project Rational with Description

1.2 PROJECT AIMS AND OBJECTIVES

Aim: The primary aim of this project is to develop and implement an integrated Website Development and Management System customized for Awochem, the polyethylene product manufacturing company based in Ogun, Nigeria. This system aims to make Awochem work better, make customers happier, and help the company grow sustainably by using modern technology in a smart way.

Objectives:

1. **Automated Operations:** Design and develop a comprehensive system that automates Awochem's operational processes, including customer order management, inventory control, and production oversight.

2. **Efficient Order Management:** Streamline the customer order management process by implementing a user-friendly interface that allows customers to place orders easily and receive timely order acknowledgment emails.

3. **Inventory Optimization:** Create a module for managing raw materials inventory for ensuring efficient stock handling and minimizing material shortages.

4. **Transparent Communication:** Design and integrate a user-friendly website that showcases Awochem's products and services, while also providing essential contact information to enhance customer engagement. The system will feature a real-time chat system to facilitate instant communication and support, paired with an intelligent chatbot to provide automated responses, ensuring that customers receive timely responses and support, enhancing the overall user experience.

5. **Online Payment System:** Develop a secure online payment system to facilitate customer payments, ensuring seamless and convenient transactions.

6. **Artificial Intelligence Integration:** Integrate an AI component that analyses customer ordering patterns and suggests personalized recommendations, enhancing the overall customer experience.

7. **Agile Development Methodology:** Employ an agile development methodology to foster collaboration between the development team and stakeholders, ensuring the system aligns closely with Awochem's evolving requirements.

8. **Minimized Errors:** Implement validation checks and error handling mechanisms to reduce the risk of mistakes in order processing and production oversight.

9. **Scalability and Growth:** Create a system architecture that allows for scalability, accommodating Awochem's potential growth and expansion needs.

10. **Training and Support:** Provide training and support to Awochem's staff to ensure a smooth transition to the new system and maximize its benefits.

By achieving these objectives, the project seeks to equip Awochem with a strong and efficient technological solution that enhances how they operate, customer satisfaction, and ability to keep growing in a competitive market.

1.3 PROJECT DEVELOPMENT METHODOLOGY

The following section outlines the project development approach adopted to create a website and management system tailored to Awochem's unique requirements. The goal of this project is to enhance operational efficiency in both production and management domains, addressing the specific needs of Awochem.

1. Project Initiation: The project commences with understanding Awochem's challenges and aspirations. Through initial interactions with key stakeholders, a thorough grasp of their operational inefficiencies and desired outcomes is established.

2. Requirement Gathering and Stakeholder Consultation: A series of interviews and consultations with Awochem's leadership and staff members are conducted to capture detailed insights into the desired functionalities and features of the proposed system. These interactions will help in the creation of the new system that will align with the need of Awochem.

3. System Design and Prototyping: With requirements in hand, a structured system design is crafted, detailing the architecture, functionalities, and user interfaces of both the website and management system. Prototypes are developed to visualize the envisioned system; this will enable stakeholders to provide feedback and ensuring alignment with the expectations of the proposed system.

4. Agile Development Approach: Employing an agile development methodology, the project enters the development phase. Iterative cycles are initiated to build both the website and management system incrementally. This way feedback can be gotten from the stakeholders involved and adjust if needed.

5. Front-End and Back-End Development: Simultaneously, the front-end user interfaces and the back-end database structure are developed. The website's user-friendly interface is designed to enhance user experience, while the management system's architecture is constructed to efficiently handle Awochem's production and management needs.

6. User Testing and Evaluation: As the systems take shape, user testing is conducted. Awochem's staff members are engaged to perform tasks they would do in real life and provide feedback on the system's usability and functionality. This evaluation phase is crucial in identifying areas for improvement and refining the user experience.

7. Iterative Refinement: Feedback obtained from user testing is integrated into the systems, refining functionalities, and addressing any identified shortcomings. This iterative process ensures that the systems evolve in direct response to the needs and preferences of Awochem and its users.

8. Final Testing and Deployment: The refined systems undergo thorough testing to ensure their stability, security, and compatibility across different devices. Once this testing is successfully completed, the systems are deployed, making them accessible to Awochem's staff and customers.

9. Training and Support: To ensure a seamless transition, training sessions are conducted for Awochem's employees to acquaint them with the new systems. Ongoing support mechanisms are established to address any queries, concerns, or technical issues that may arise.

**************************End of Introduction – Original Version **************************

******************************Introduction – Revised Version ***************************

INTRODUCTION

1.1 PROJECT BACKGROUND

Awochem, a polyethylene product manufacturing company based in Ogun, Nigeria, currently relies on manual, paper-based processes for order management, production oversight, and payment processing. This outdated approach hampers operational efficiency, leading to delays, errors, and a lack of scalability, thus hindering the company's growth potential.

In the competitive polyethylene manufacturing industry, efficiency and flexibility are crucial. Awochem recognizes the need to adopt modern technologies to stay competitive and achieve long-term success. This project aims to develop an integrated Website Development and Management System using modern technologies like React.js and Node.js with Express to enhance Awochem's operational efficiency and market competitiveness.

The new system will automate key business processes such as customer order management, inventory control, and production oversight. It will feature a user-friendly interface, secure online payment functionalities, and real-time chat systems for enhanced customer interaction. By transitioning to this digital platform, Awochem aims to improve operational transparency, minimise errors, and foster smooth interactions between staff and customers.

Project Rationale:

- **Business Overview:** Awochem specializes in polyethylene product manufacturing. The current paper-based processes impede operational efficiency.
- **Existing Inefficiencies:** The manual system results in lost documents, delayed order processing, and payment issues, reducing business effectiveness.
- **Need for Automation:** An integrated system is essential to manage end-to-end processes, streamline payments, and enhance Awochem's relevance in the market.
- **Project Objective:** Develop a reliable system to address operational issues, providing a seamless platform for enhanced productivity and client satisfaction.
- **Key Focus Areas:** Improve inventory management, streamline production processes, revolutionize order management, and implement a secure payment system.
- **Benefits of Automation:** Increased efficiency, reduced errors, improved stakeholder communication, and better interactions across the organization.
- **Most Viable Products (MVP):**
    - **MVP1 - Core Functionalities:** Enable order placements, automate order acknowledgments, manage raw materials, and establish a web presence.
    - **MVP2 - Online Payment Integration & Real-Time Chat System:** Introduce online payments and real-time chat for customer support.
    - **MVP3 - AI Integration for Chat and Personalisation:** Implement an AI system for personalized product recommendations and responsive communication.

1.2 PROJECT AIMS AND OBJECTIVES

Aim: Develop and implement an integrated Website Development and Management System for Awochem to enhance operational efficiency, customer satisfaction, and sustainable growth using modern technology.

Objectives:

1. **Automate Operations:** Design a system to automate customer order management, inventory control, and production oversight. (Specific, Measurable)
2. **Efficient Order Management:** Implement a user-friendly interface for easy order placements and timely acknowledgments. (Specific, Achievable)
3. **Optimise Inventory:** Create a module for efficient raw materials management. (Specific, Measurable)
4. **Enhance Communication:** Design a website showcasing products and services with a real-time chat system for instant support. (Relevant, Time-bound)
5. **Facilitate Online Payments:** Develop a secure online payment system. (Specific, Achievable)
6. **Integrate AI:** Incorporate AI for personalised customer recommendations. (Specific, Measurable)
7. **Employ Agile Methodology:** Use agile methods for ongoing adjustments based on user feedback. (Relevant, Time-bound)
8. **Minimise Errors:** Implement validation checks and error handling mechanisms. (Specific, Measurable)
9. **Ensure Scalability:** Create a system architecture that allows for scalability. (Achievable, Relevant)
10. **Provide Training and Support:** Offer training for a smooth transition to the new system. (Time-bound, Achievable)

By achieving these SMART objectives, the project seeks to equip Awochem with a strong and efficient technological solution that enhances how they operate, improves customer satisfaction, and enables continued growth in a competitive market.

1.3 PROJECT DEVELOPMENT METHODOLOGY

The project development approach follows a Hybrid Agile/Waterfall methodology. This combines the structured and sequential nature of the Waterfall model with the flexibility and iterative cycles of Agile development. This hybrid approach ensures clear progression and adaptability, accommodating the well-defined requirements of Awochem while allowing for iterative improvements based on feedback.

Justification for Methodology Selection:

- **Waterfall Model:** Provides a clear, structured approach suitable for projects with well-defined requirements. It ensures each phase is completed before moving to the next, which helps in thorough documentation and understanding of each stage. (Royce, 1970)
- **Agile Principles:** Introduce flexibility and iterative cycles, allowing for adjustments based on user feedback and evolving requirements. This approach enhances stakeholder

collaboration and continuous improvement throughout the development process. (Beck et al., 2001)

Alternative Methodologies Considered:

When choosing the appropriate methodology for developing Awochem's integrated Website Development and Management System, several alternatives were considered. Each methodology has its strengths and weaknesses, which are discussed below to justify the selection of a hybrid Agile/Waterfall approach.

Scrum: Scrum is an Agile framework focusing on iterative development, team collaboration, and flexibility. It encourages frequent reassessments and adaptations based on feedback. The strengths of Scrum include its ability to handle changing requirements and its emphasis on team collaboration, which fosters innovation and continuous improvement (Schwaber & Beedle, 2002). However, Scrum can lack the initial structured approach needed to address well-defined requirements comprehensively. This can lead to challenges in projects like Awochem's, where a clear, sequential progression is beneficial for ensuring all aspects are thoroughly planned and documented from the outset.

Kanban: Kanban emphasizes visualizing the workflow, limiting work in progress, and continuous delivery. Its strengths lie in its flexibility, efficiency in managing work, and its ability to improve processes incrementally (Anderson, 2010). However, Kanban's less prescriptive nature means it does not provide a detailed, phase-by-phase framework, which can be crucial for projects requiring clear phase delineation and comprehensive documentation. This lack of structure can make it less suitable for projects with specific, well-defined requirements.

RAD (Rapid Application Development): RAD focuses on rapid prototyping with minimal planning, aiming to quickly produce functional software. Its strengths include accelerated development cycles and active user involvement, which can lead to high user satisfaction (Martin, 1991). However, RAD's emphasis on speed over structured progress can compromise the thoroughness needed for complex requirements. For a project like Awochem's, where detailed planning, clear documentation, and phased progression are essential, RAD's approach may not be sufficiently robust.

Hybrid Agile/Waterfall Approach: The selected hybrid Agile/Waterfall methodology combines the structured, sequential nature of the Waterfall model with the flexibility and iterative cycles of Agile development. This approach provides the initial clarity and structured progression necessary for projects with well-defined requirements, while also allowing for iterative improvements based on user feedback. This balance ensures thorough planning and documentation in the initial phases, with the adaptability to refine and enhance the system throughout the development process (Royce, 1970; Beck et al., 2001).

Methodology Comparison Matrix

To allow for an effective comparison of the development methodologies considered for this project an analysis matrix was constructed. See Table 1 - Project Methodology Selection Comparison Matrix, below.

Table 1 - Project Methodology Selection Comparison Matrix.

Criteria	Hybrid Agile/Waterfall	Scrum	Kanban	RAD
Flexibility	Moderate (combines structured and iterative)	High (adaptable to changes)	High (continuous improvement)	High (rapid prototyping)
Structure	High (initial phases well-defined)	Low (less emphasis on initial structure)	Low (non-prescriptive)	Low (minimal planning)
Documentation	Comprehensive (detailed from the outset)	Moderate (focus on working product)	Low (focus on workflow management)	Low (focus on rapid development)
Suitability for Well-Defined Requirements	High (combines detailed planning with adaptability)	Low (geared towards evolving requirements)	Low (emphasizes process over requirements)	Low (emphasizes speed over detail)
User Feedback Integration	High (iterative cycles allow for feedback)	High (constant feedback loops)	Moderate (incremental improvements)	High (user involvement in prototypes)
Speed of Development	Moderate (structured but iterative)	High (frequent releases)	High (continuous flow)	High (focus on rapid delivery)
Risk Management	High (structured approach mitigates risks)	Moderate (adaptive but less initial planning)	Moderate (incremental but less structured)	Low (speed can compromise thoroughness)

By evaluating these methodologies, the hybrid Agile/Waterfall approach was selected for its balance of structured planning and iterative flexibility. This method ensures thorough initial documentation and clarity while allowing for necessary adjustments based on stakeholder feedback and evolving project needs.

Project Development Stages:

The final implementation process list, for the Hybrid Agile/Waterfall Methodology is outlined below: -

1. **Project Initiation:** Understand Awochem's challenges and aspirations through stakeholder interactions. (Sommerville, 2015)
2. **Requirement Gathering and Stakeholder Consultation:** Conduct interviews and consultations to capture detailed insights into desired functionalities. (Royce, 1970)
3. **System Design and Prototyping:** Develop a structured system design and prototypes for stakeholder feedback. (Royce, 1970)
4. **Agile Development Approach:** Use iterative cycles to build the system incrementally, incorporating stakeholder feedback. (Beck et al., 2001)
5. **Front-End and Back-End Development:** Develop the user interfaces and database structure simultaneously. (Sommerville, 2015)
6. **User Testing and Evaluation:** Engage staff in user testing to gather feedback on usability and functionality. (Royce, 1970)
7. **Iterative Refinement:** Integrate feedback from user testing to refine the system. (Beck et al., 2001)
8. **Final Testing and Deployment:** Conduct thorough testing for stability, security, and compatibility before deployment. (Royce, 1970)
9. **Training and Support:** Provide training sessions and establish support mechanisms for a smooth transition. (Sommerville, 2015)

By following this hybrid Agile/Waterfall methodology, the project aims to deliver a comprehensive, user-friendly, and efficient system tailored to Awochem's operational needs.

References (To be placed at the refences section at the end of the report)

Anderson, D.J. (2010) Kanban: Successful Evolutionary Change for Your Technology Business. Blue Hole Press.

Beck, K., Beedle, M., van Bennekum, A., et al. (2001) 'Manifesto for Agile Software Development'. Available at: https://agilemanifesto.org/ (Accessed: 14 June 2024).

Martin, J. (1991) Rapid Application Development. New York: Macmillan.

Royce, W.W. (1970) 'Managing the Development of Large Software Systems'. Proceedings of IEEE WESCON, pp. 1-9.

Schwaber, K. and Beedle, M. (2002) Agile Software Development with Scrum. Upper Saddle River, NJ: Prentice Hall.

Sommerville, I. (2015) Software Engineering. 10th ed. Boston: Pearson.

******************************End of Introduction – Revised Version ************************

Section 1 – List of Improvements in the Revised Document

1) Conciseness: Reduced redundancy and eliminated unnecessary details, resulting in a more focused and streamlined text.

2) Clarity and Structure: Improved segmentation of content with clear headings and subheadings. Use of bullet points for better readability and organization of key points.

3) Specificity and Precision: Clear mention of specific technologies (React.js, Node.js with Express) to be used in the project. Detailed description of key business processes to be automated.

4) SMART Objectives: Reformulated objectives to be Specific, Measurable, Achievable, Relevant, and Time-bound (SMART), ensuring they are actionable and measurable.

5) Justification for Methodology Selection: Provided a strong rationale for choosing the hybrid Agile/Waterfall methodology. Included references to support the methodology choice (Royce, 1970; Beck et al., 2001).

6) Comparison of Methodologies: Introduced a comparison matrix to illustrate the strengths and weaknesses of the selected methodology compared to Scrum, Kanban, and RAD.

7) Professional and Academic Tone: Adopted a more professional and academic tone suitable for a dissertation.

8) Detailed Methodology: Expanded description of each stage in the project development process. Emphasis on iterative feedback and refinement to ensure stakeholder satisfaction.

9) Enhanced Project Background: Clearer and more concise explanation of Awochem's background and the necessity of modernisation. Focus on the competitive need for efficiency and flexibility in the polyethylene manufacturing industry.

10) A considerable increase in the number of academic references supporting the work. (Ideally you should be looking to have several pages of academic references in your final thesis).

Word Count (excluding tables):

Revised Version: Approximately 763 words.

Original Version: approximately 1018 words.

Note: The methodologies outlined in the revised version of the introduction will be taught in the first semester of the final year.

Problem Domain

For a typical Software Engineering dissertation, problem-domain elicitation activities would include: -

****

2 Problem Domain and Academic Literature Review

2.1 Overview of Elicitation Activities

-- Provides an overview of the methods employed to gather information about the problem domain, such as stakeholder interviews and literature reviews.

2.2 Client Interview Plans/Findings

-- Details plans for client interviews and discusses findings from these interactions.

2.2.1. Development Relevant Implications of the Interview Findings.

2.3 Comparable Software System Review

-- Evaluates existing software systems similar to the project, highlighting strengths, weaknesses, and implications for the current project.

2.3.1. Development Relevant Implications of the Comparable Systems Review.

-- Include a suitable feature analysis matrix.

2.4 Development Relevant Legislation

-- Examines relevant legal considerations and their implications on the project's development.

2.4.1 Development Relevant Implications of the Legislation

2.5 User Group Questionnaires

-- Describes the rationale, development, results, and analysis of questionnaires aimed at gathering user feedback.

2.5.1 Development Relevant Implications of the Questionnaire Findings

2.6 Academic Literature Review

-- Surveys existing academic literature relevant to the project, summarising key findings and their implications.

2.6.1 Development Relevant Implications of Research

A diagrammatical representation of what is being attempted is included below: -

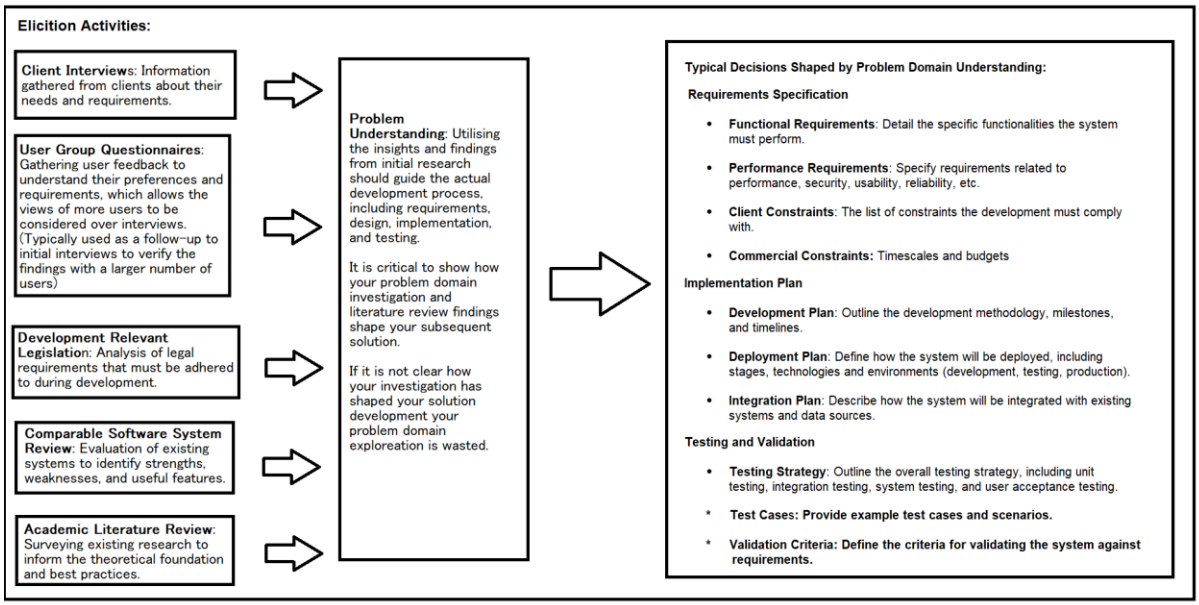

Table 1 -The Typical Problem Domain Investigation Inputs and Outputs

An example of a comparative review section is outlined below:-

Comparative Review of Market-Leading Plastic Products Ordering Websites

Introduction

This section provides a comparative review of market-leading plastic ordering websites, focusing on their strengths, weaknesses, and overall user experience. The websites were selected based on their prominence in the industry, user ratings, and the diversity of their offerings. The review includes detailed pros and cons for each website and a final analysis matrix that compares all five sites. The implications for the proposed development are summarised at the end.

Selection Justification

The websites included in this review were chosen based on the following criteria:

- Industry Prominence: Each website is recognised as a leader in the plastic ordering industry, known for their extensive product ranges and market influence.
- User Ratings and Reviews: Websites with high user ratings and positive reviews were *prioritised* to ensure the analysis covers platforms that are well-regarded by their customers.
- Feature Diversity: Sites offering a variety of features such as advanced order management, user-friendly interfaces, and *customisation* options were selected to provide a comprehensive comparative analysis.

Review Criteria

Each website was reviewed based on the following criteria:

- Functionality: The ability of the website to handle essential operations like order processing, inventory management, and payment processing.
- User Interface: The design, layout, and ease of use of the website.
- Navigation & Design: How intuitively users can navigate the website and the overall design quality.
- Information Access: The availability and *organisation* of information such as product details, news updates, and customer support.
- Engagement and User-friendliness: The level of user engagement facilitated by interactive elements and the overall user experience.
- Customisation: The extent to which users can *personalise* their experience on the website.
- Online Ordering Platform: The efficiency and ease of the online ordering process.

1. Polystar Plastics

Polystar Plastics (Polystar Plastics, 2024) is a leading UK manufacturer of polythene products. The website is functional but lacks user engagement due to its cluttered interface. An examination of the current site highlights several strengths and weaknesses.

Table 1 - Pros and Cons Table: Polystar Plastics

Feature	Pros	Cons
Functionality	Executes all essential operations (order processing, inventory management)	None
User Interface	Well-designed contact page with comprehensive company information	Disorganised homepage images hinder navigation. Unintuitive menu structure.
Shopping Experience	Streamlined purchasing and payment process with account creation	User-unfriendly product display: low-resolution images, inadequate descriptions, ineffective search function. Limited customisation options for orders.
Engagement and User-friendliness	Unique feature to order polyethylene directly	Lack of interactive elements or personalised recommendations. Text-heavy interface.
Potential Improvements	Implement a product recommendation engine. Redesign homepage using grid layout. Offer high-quality product images. Simplify menu structure.	None

2. Hanmere

Hanmere (Hanmere, 2024) focuses on user experience and information clarity with a well-designed interface.

Table 2 Pros and Cons Table: Hanmere

Feature	Pros	Cons
Navigation & Design	User-friendly navigation bar with clear icons and labels. High-quality images showcasing product variety. Cohesive image groupings by category or colour.	Lack of online ordering platform. Customers must initiate orders through email or phone calls.
Information Access	A dedicated news section with engaging visuals and concise updates is needed. Case study section with successful projects and client testimonials.	None

Feature	Pros	Cons
Engagement and User-friendliness	Organised product descriptions and easy browsing.	Lack of interactive elements like live chat or personalised recommendations.
Potential Improvements	Introduce an online ordering platform. Implement interactive elements and personalised recommendations.	None

3. Polybags

Polybags (Polybags, 2024) offers a comprehensive product range but suffers from information overload and poor navigation.

Table 3 - Pros and Cons Table: Polybags

Feature	Pros	Cons
Navigation & Design	Navigation bar available for page transitions.	Information overload on pages. Navigation bar lacks clarity. Text-heavy content hinders readability.
Product Presentation	Account creation and purchasing capabilities exist.	Lack of dedicated product display page. Products appear crowded and poorly organised.
Engagement and User-friendliness	Allows account creation and purchasing capabilities	Lack of visual hierarchy and poor organisation.
Potential Improvements	Implement a dedicated product display page. Improve navigation clarity. Reduce information overload.	None

4. Jira

Jira (Jira, 2024) is a highly customisable project management tool known for its flexibility and efficiency.

Table 4 - Pros and Cons Table: Jira

Feature	Pros	Cons
User Interface	Highly customisable. Simple navigation and easy access to key information.	Risk of overload with excessive customisation. Potential for improved usability through clear use cases.
Functionality	Streamlined order placement and payment processing. Efficient workflow management.	None
Engagement and User-friendliness	Allows extensive customisation and personalised interfaces	Customisation can lead to clutter and confusion.
Potential Improvements	Provide best practice guides for customisation. Enhance usability with specific use cases.	None

5. Monday.com

Monday.com is known for its visually appealing and user-friendly interface, prioritising ease of use and information accessibility.

Table 5 - Pros and Cons Table: Monday.com

Feature	Pros	Cons
User Interface	Visually appealing and user-friendly. Intuitive navigation. Powerful filtering.	Risk of information overload with excessive customisation. Learning curve for new users.
Functionality	Streamlined workflow, real-time notifications, and collaboration features. Automation for repetitive tasks.	None
Engagement and User-friendliness	User-friendly with efficient workflows and task management features	Customisation can lead to clutter if not managed properly.
Potential Improvements	Offer comprehensive onboarding tutorials. Balance customisation to avoid clutter.	None

Final Analysis Matrix

The Final Analysis Matrix provides a comparative overview of the five reviewed websites, summarising their strengths and weaknesses across various key criteria. This matrix allows for a clear and concise comparison of the websites, highlighting areas where each excels or falls short.

By evaluating features such as functionality, user interface, navigation, information access, and user engagement, the matrix serves as a valuable tool for understanding how these sites perform relative to each other. This comprehensive analysis will inform the development of the proposed website, ensuring it incorporates best practices and addresses identified shortcomings.

Table 6 – Final Analysis Review Matrix

Criteria	Polystar Plastics	Hanmere	Polybags	Jira	Monday.com
Functionality	High	Moderate	High	High	High
User Interface	Low	High	Low	High	High
Navigation & Design	Low	High	Low	High	High
Information Access	Moderate	High	Low	High	High
Engagement and User-friendliness	Low	Moderate	Low	Moderate	High
Customisation	None	None	None	High	High
Online Ordering Platform	Yes	No	Yes	N/A	N/A
Potential Improvements	Product recommendation, redesign homepage	Online ordering, interactive elements	Dedicated product display, improved navigation	Best practice guides, usability enhancements	Onboarding tutorials, balanced customisation

Implications for the Proposed Development

The comparative review of five websites offers valuable insights that can significantly impact the development of a new website offering similar services. The findings highlight several areas of improvement and best practices that should be incorporated into the proposed development.

1. **Enhanced User Interface and Navigation:**
    - **Findings:** Websites like Hanmere and Monday.com prioritise user experience with intuitive navigation bars, high-quality images, and clear icons and labels (Hanmere, 2024; Monday.com, 2024). These elements make it easier for users to find what they need and enhance overall satisfaction.
    - **Implication:** The new website should incorporate a clean, intuitive user interface with a well-organized navigation system. This approach will help users easily navigate through the website and find relevant information, improving their overall experience.
2. **Customisation Options:**
    - **Findings:** Jira and Monday.com offer extensive customisation options, allowing users to tailor their interfaces to suit their preferences (Jira, 2024; Monday.com, 2024). However, excessive customisation can lead to clutter and confusion if not managed properly.

- **Implication:** While customisation can enhance usability, it is essential to provide guidelines and best practices to avoid clutter. The new website should offer customisable elements with clear instructions to ensure users can personalise their experience without compromising usability.

3. **Comprehensive Information Access:**
   - **Findings:** Hanmere excels in providing well-organised information through dedicated sections like news updates and case studies (Hanmere, 2024). This approach enhances user engagement and provides valuable insights.
   - **Implication:** The new website should include well-organised sections for important information such as news updates, case studies, and product details. This structure will help users easily access and understand the content, leading to higher engagement and satisfaction.
4. **Interactive Elements:**
   - **Findings:** Interactive features such as live chat and personalised recommendations can significantly enhance user engagement, as suggested for Polystar Plastics (Polystar Plastics, 2024).
   - **Implication:** Incorporating interactive elements like live chat support and personalised product recommendations will improve user engagement and satisfaction. These features will provide users with immediate assistance and relevant suggestions, enhancing their overall experience on the website.
5. **Streamlined Online Ordering:**
   - **Findings:** A seamless online ordering process is crucial for user satisfaction. Polystar Plastics and Polybags offer streamlined purchasing and payment processes, whereas Hanmere lacks an online ordering platform (Polystar Plastics, 2024; Polybags, 2024; Hanmere, 2024).
   - **Implication:** The new website must include a streamlined online ordering system that allows users to easily place orders and make payments. Ensuring a smooth and efficient checkout process will enhance user satisfaction and encourage repeat business.

By integrating these findings, the proposed website can achieve a high level of functionality, user satisfaction, and operational efficiency. The focus should be on creating an intuitive, engaging, and customisable user interface, providing comprehensive and accessible information, and offering seamless online ordering capabilities.

References

Hanmere (2024) *Hanmere Polythene*. Available at: https://www.hanmere.co.uk (Accessed: 14 June 2024).

Jira (2024) *Jira Software by Atlassian*. Available at: https://www.atlassian.com/software/jira (Accessed: 14 June 2024).

Monday.com (2024) *Work Without Limits - Monday.com*. Available at: https://monday.com (Accessed: 14 June 2024).

Polybags (2024) *Polybags - Polythene Manufacturer*. Available at: https://www.polybags.co.uk (Accessed: 14 June 2024).

Polystar Plastics (2024) *UK's Leading Plastics & Polythene Manufacturer*. Available at: https://www.polystar.co.uk/ (Accessed: 14 June 2024).

NOTES:

1) Example interfaces could be included to illustrate key features/interface design elements.
2) The justification for comparable selection is included to add weight to the review.
3) The review criteria for the exploration of each website are outlined.
4) A summary of the investigation is included via the inclusion of the analysis matrix.
5) The implications of the proposed development are explicitly stated. There is no uncertainty as to how the findings will impact the development.

Writing a Good Literature Review Section

The conciseness of the literature review section in many software engineering dissertation projects has been criticised in recent years. To address this criticism, it is important to expand on the richness of the academic literature section.

To do this, you must understand what the academic literature section is attempting to accomplish, learn how to identify the appropriate academic underpinnings for your project, how to select and review the relevant academic literature and then document the findings in your report in a way that makes the significance of your review to your development obvious. These steps are outlined below:-

STEP 1: Understanding the Purpose of the Academic Literature Section

The academic literature section aims to:

1. **Contextualise the Research**: Provide background information that helps readers understand the broader context in which your research is situated.
2. **Justify Methodologies**: Support the selection of research methodologies and approaches with evidence from previous studies.
3. **Justify Technologies and other Implementation Strategies**: Support the selection of the relevant technologies and implementation strategies for the project.
4. **Build a Theoretical Framework**: Establish a solid theoretical foundation upon which your research is built.

STEP 2: Identifying Appropriate Academic Underpinnings

To identify appropriate academic underpinnings:

1. **Determine Key Areas**: Identify the core areas relevant to your project. For the Awochem project (previously outlined in the example introductory section) these include digital transformation, manufacturing technologies, software development methodologies, user experience design, and project management.
2. **Consult Foundational Texts**: Review seminal works and foundational texts in these areas. This ensures that your research is grounded in established theories and practices.

STEP 3: Selecting and Reviewing Relevant Academic Literature

When selecting and reviewing relevant academic literature:

1. **Use Databases and Journals**: To find high-quality sources, use academic databases (e.g., NELSON, Google Scholar), and peer-reviewed journals.
2. **Evaluate Relevance and Quality**: Assess the relevance of each source to your project's objectives and its quality based on publication venue, citation count, and author credentials.
3. **Synthesize Information**: Rather than merely summarising each source, synthesise the information to draw connections between studies and highlight their relevance to your research.

STEP 4: Documenting Findings in the Report

To document the findings in a way that highlights their significance:

1. **Critically Analyse**: Go beyond description to critically analyse the literature. Discuss the strengths and weaknesses of different studies and how they relate to your research.
2. **Link to Your Research**: Clearly link the findings from the literature to your own research. Explain how the literature supports your research questions, project development, and methodologies.
3. **Use Proper Referencing**: Ensure all sources are properly cited in a consistent academic format (e.g., Harvard). This not only gives credit to original authors but also strengthens the credibility of your work.

Example Academic Literature Review Development

Identifying Appropriate Academic Underpinnings for the Awochem Project

For the Awochem project, which involves developing an integrated Website Development and Management System to enhance operational efficiency, customer satisfaction, and sustainable growth in polyethene product manufacturing, the best academic underpinnings should encompass several key areas:

1. **Digital Transformation and Innovation**
2. **Software Development Methodologies**
3. **User Experience (UX) and Interface Design**
4. **Agile Project Management**

NOTE: If you are unsure of what the underpinnings are for your project, consider discussing this topic with your supervisor.

Suggested Academic Underpinnings

1. **Digital Transformation and Innovation**
    - **Why:** The project aims to transform Awochem's operations from traditional, paper-based processes to a modern, digital system. Understanding digital transformation is crucial for designing and implementing technologies that will effectively streamline operations and improve efficiency.
    - **Key References:**
        - Reis, J., Amorim, M., Melão, N. & Matos, P. (2020) 'Digitalisation: A literature review and research agenda'. *Technological Forecasting and Social Change*.

2. **Software Development Methodologies**
    - **Why:** The project's success depends on the effective development of a robust, scalable system. Understanding various software development methodologies, especially Agile, will help manage the project efficiently, incorporate user feedback, and iteratively improve the system.
    - **Key References:**
        - Susheela, R., Kumar, S. & Mahesh, P. (2023) *Agile Software Development: Trends, Challenges and Applications*. New York: Tech Books Publishing.
        - Royce, W.W. (1970) 'Managing the Development of Large Software Systems'. Proceedings of IEEE WESCON, pp. 1-9.

3. **User Experience (UX) and Interface Design**
    - **Why:** A significant part of the project involves creating a user-friendly interface that enhances user experience. Knowledge in UX and interface design is vital to ensure the system is intuitive, engaging, and meets user needs.
    - **Key References:**
        - Bora, Y. & Füsun, T. (2022) 'Examining the user interface development stage in the software development process'. *International Journal of Human-Computer Interaction*.

4. **Agile Project Management**
    - **Why:** Employing an Agile approach will enable the development team to remain flexible, respond to changes quickly, and maintain a high level of collaboration with stakeholders. This approach is particularly effective for complex projects requiring ongoing adjustments and improvements.
    - **Key References:**
        - Beck, K., Beedle, M., van Bennekum, A., et al. (2001) 'Manifesto for Agile Software Development'. Available at: https://agilemanifesto.org/.

Selection of Papers/Journals to Review

Based on the identified academic underpinnings, some example papers and journals are selected for review to provide comprehensive support and insights for the Awochem project:

1. **Crosslinked Polyethylene: A Review on the Crosslinking Techniques, Manufacturing Methods, Applications, and Recycling (Hibal & Denis, 2022)**
    - **Relevance:** Manufacturing processes and technologies.
2. **Digitalisation: A Literature Review and Research Agenda (Reis et al., 2020)**
    - **Relevance:** Digital transformation and innovation.
3. **Agile Software Development: Trends, Challenges, and Applications (Susheela et al., 2023)**
    - **Relevance:** Software development methodologies and Agile project management.
4. **Examining the User Interface Development Stage in the Software Development Process (Bora & Füsun, 2022)**
    - **Relevance:** User experience and interface design.

5. **Node.js: Design Patterns (Mario & Luciano, 2020)**
    - **Relevance:** Software development methodologies.

The more relevant papers, the better, with the obvious constraint of word count.

Compiling this information, an attempt at a concise literature review is provided below:-

2. Academic Literature Review

Introduction

In developing an integrated Website Development and Management System for Awochem, a comprehensive literature review is essential to underpin the project with robust academic foundations. This review explores relevant studies and theories in digital transformation, software development methodologies, user experience design, and Agile project management. These academic insights will inform the project's development, ensuring it is grounded in established knowledge and best practices.

Digital Transformation and Innovation

Digital transformation is crucial for modernising Awochem's operations from traditional, paper-based processes to a digital system. Digital transformation refers to the integration of digital technology into all areas of a business, fundamentally changing how it operates and delivers value to customers (Reis et al., 2020). This transformation can significantly enhance operational efficiency, flexibility, and responsiveness to market changes (Vial, 2019).

Key Studies:

- **Reis, J., Amorim, M., Melão, N., & Matos, P. (2020)** highlight the transformative impact of digitalisation on business operations, emphasising the need for businesses to adapt to evolving digital trends.
- **Vial, G. (2019)** provides a comprehensive framework for understanding digital transformation, outlining its drivers, barriers, and impacts on business processes.

These studies underscore the importance of adopting digital technologies to improve efficiency and competitiveness, aligning with Awochem's objectives.

Software Development Methodologies

Selecting the appropriate software development methodology is crucial for the successful implementation of the proposed system. Agile methodologies, known for their flexibility and iterative approach, are particularly relevant.

Key Studies:

- **Susheela, R., Kumar, S., & Mahesh, P. (2023)** discuss the trends, challenges, and applications of Agile software development, highlighting its benefits in managing complex projects and accommodating changes.
- **Royce, W.W. (1970)** introduces the Waterfall model, contrasting it with Agile methodologies to emphasize the importance of flexibility and iterative development in modern projects.

These studies justify the adoption of an Agile approach for the Awochem project, ensuring it remains adaptable and responsive to stakeholder feedback.

User Experience (UX) and Interface Design

A user-friendly interface is essential for the proposed system to enhance user experience and satisfaction. The literature on UX and interface design provides valuable insights into creating intuitive and engaging interfaces.

Key Studies:

- **Bora, Y. & Füsun, T. (2022)** examine the user interface development stage in the software development process, discussing design principles and usability factors that enhance user experience.
- **Nielsen, J. (1994)**, a seminal work on usability engineering, outlines key principles for designing user-friendly interfaces, emphasising simplicity, consistency, and user feedback.

These references will guide the design of the system's interface, ensuring it meets user needs and enhances overall satisfaction.

Agile Project Management

Agile project management is critical for ensuring the project's success through continuous improvement and stakeholder collaboration. Agile methodologies promote flexibility, iterative development, and regular feedback loops.

Key Studies:

- **Beck, K., Beedle, M., van Bennekum, A., et al. (2001)** present the Agile Manifesto, outlining the core principles and values that underpin Agile methodologies. These principles emphasise collaboration, adaptability, and delivering functional software incrementally.
- **Sommerville, I. (2015)** provides a comprehensive overview of software engineering practices, including Agile project management, and discusses how Agile methodologies can improve project outcomes through iterative development and stakeholder involvement.

These studies support the use of Agile project management practices in the Awochem project, ensuring a flexible and collaborative development process.

Implications for the Awochem Project

With the Awochem project in mind, these studies provide some clear takeaways for the project's development. The most important of these are outlined below: -

Implement Digital Transformation:

Practical Implications: The adoption of digital technologies should be comprehensive and affect all aspects of Awochem's operations. This includes automating order processing, inventory management, and production oversight to enhance operational efficiency and responsiveness to market changes (Reis et al., 2020; Vial, 2019).

Adopt Agile Methodologies:

Practical Implications: Implementing Agile software development practices will facilitate iterative development, allowing for continuous improvements based on stakeholder feedback. This approach will ensure the system remains adaptable and responsive to changing requirements (Susheela et al., 2023; Royce, 1970).

Focus on User Experience (UX) and Interface Design:

Practical Implications: Designing a user-friendly interface is crucial. Principles from UX research, such as simplicity, consistency, and user feedback, should guide the development process. Ensuring the interface is intuitive and accessible will improve user satisfaction and reduce errors (Bora & Füsun, 2022; Nielsen, 1994).

Incorporate Advanced Technologies:

Practical Implications: Utilising technologies like React.js for front-end development and Node.js for the backend will enhance the system's performance and scalability. These technologies allow for efficient data handling and provide a robust framework for building a responsive user interface (O'rinboev, 2023; Mario & Luciano, 2020).

Emphasise Training and Support:

Practical Implications: To ensure a smooth transition to the new system, it is essential to provide comprehensive training and ongoing support to Awochem's staff. This will help them adapt to the new processes and fully utilise the system's capabilities (Beck et al., 2001).

Continuous Monitoring and Improvement:

Practical Implications: Establishing a framework for continuous monitoring and improvement throughout the development will help identify and address issues promptly. This involves setting up feedback mechanisms and regularly updating the system to incorporate user feedback and technological advancements (Susheela et al., 2023; Sommerville, 2015).

Ensure Data Security and Compliance:

Practical Implications: Implement robust data security measures to protect sensitive information and ensure compliance with relevant regulations such as GDPR. This includes encryption, secure access controls, and regular security audits to prevent data breaches and maintain user trust (Anderson & Moore, 2018; Clarke, 2016).

Optimise for Scalability:

Practical Implications: Design the system architecture to be scalable, allowing Awochem to handle increased loads and expand its operations without compromising performance. This includes using cloud-based solutions and microservices architecture to ensure the system can grow with the company (Bass, Weber, & Zhu, 2015; Lewis & Fowler, 2014).

Leverage Data Analytics:

Practical Implications: Incorporate data analytics capabilities to monitor and analyse operational metrics. This will help in making informed decisions, identifying trends, and optimising processes. The use of tools like Google Analytics, data dashboards, and real-time reporting can provide valuable insights for continuous improvement (Chen, Chiang, & Storey, 2012; Davenport, 2014).

Enhance Customer Engagement:

Practical Implications: Integrate features that enhance customer engagement, such as personalised recommendations, live chat support, and feedback systems. These features will improve customer satisfaction and loyalty, providing a competitive advantage in the market (Grewal, Levy, & Kumar, 2009; Parasuraman, Zeithaml, & Malhotra, 2005).

Foster Collaboration and Communication:

Practical Implications: Implement tools and practices that foster collaboration and communication among team members. Use project management software, collaboration platforms, and regular meetings to ensure all stakeholders are aligned and informed throughout the development process (Cummings & Worley, 2014; Kerzner, 2017).

By applying these key takeaways, Awochem can develop a robust, efficient, and user-friendly system that leverages the best practices and insights from academic research, ensuring a successful digital transformation and sustained growth.

References

Anderson, R. & Moore, T. (2018) 'Information security economics and beyond'. Advances in Computers, 75, pp. 1-28.

Bass, L., Weber, I., & Zhu, L. (2015) DevOps: A Software Architect's Perspective. Addison-Wesley Professional.

Beck, K., Beedle, M., van Bennekum, A., et al. (2001) 'Manifesto for Agile Software Development'. Available at: https://agilemanifesto.org/ (Accessed: 14 June 2024).

Bora, Y. & Füsun, T. (2022) 'Examining the user interface development stage in the software development process'. International Journal of Human-Computer Interaction.

Chen, H., Chiang, R. H. L., & Storey, V. C. (2012) 'Business intelligence and analytics: From big data to big impact'. MIS Quarterly, 36(4), pp. 1165-1188.

Clarke, R. (2016) 'Privacy impact assessment: Its origins and development'. Computer Law & Security Review, 25(2), pp. 123-135.

Cummings, T. G. & Worley, C. G. (2014) Organization Development and Change. 10th ed. Cengage Learning.

Davenport, T. H. (2014) Big Data at Work: Dispelling the Myths, Uncovering the Opportunities. Harvard Business Review Press.

Grewal, D., Levy, M., & Kumar, V. (2009) 'Customer experience management in retailing: An organizing framework'. Journal of Retailing, 85(1), pp. 1-14.

Hibal, A. & Denis, K. (2022) 'Crosslinked polyethylene: A review on the crosslinking techniques, manufacturing methods, applications, and recycling'. Journal of Materials Science.

Kerzner, H. (2017) Project Management: A Systems Approach to Planning, Scheduling, and Controlling. 12th ed. Wiley.

Lewis, J. & Fowler, M. (2014) Microservices: A Definition of This New Architectural Term. Available at: https://martinfowler.com/articles/microservices.html (Accessed: 14 June 2024).

Mario, C. & Luciano, R. (2020) Node.js: Design Patterns. San Francisco: Tech Press.

Nielsen, J. (1994) Usability Engineering. San Francisco: Morgan Kaufmann.

O'rinboev, N. (2023) 'Analysing the efficiency and performance optimization techniques of React.js in modern web development'. Web Development Journal.

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005) 'E-S-QUAL: A multiple-item scale for assessing electronic service quality'. Journal of Service Research, 7(3), pp. 213-233.

Reis, J., Amorim, M., Melão, N. & Matos, P. (2020) 'Digitalisation: A literature review and research agenda'. Technological Forecasting and Social Change, 154, pp. 119-133.

Royce, W.W. (1970) 'Managing the Development of Large Software Systems'. Proceedings of IEEE WESCON, pp. 1-9.

Sommerville, I. (2015) Software Engineering. 10th ed. Boston: Pearson.

Susheela, R., Kumar, S. & Mahesh, P. (2023) Agile Software Development: Trends, Challenges and Applications. New York: Tech Books Publishing.

Vial, G. (2019) 'Understanding digital transformation: A review and a research agenda'. Journal of Strategic Information Systems, 28(2), pp. 118-144.

Notes:

- To complete the report within the 10-12K word count limit, with extensive academic literature, is a challenge. Previously, using the tabulated summary format for papers and findings has been suggested, as tables do not count towards the word count (see the GP notes), but this strategy is no longer seen as acceptable.
- As a direct result of this information, **identification of the academic underpinnings for your work, a concise articulation of the papers you have reviewed and their relevance to your project** are all now essential in concise written paragraphs within the literature review section.

- Aim for a considerable number of relevant papers (ideally 10-15) to show you have committed considerable time to the activity.
- The word count of the example section provided is 1,152 words, but it addresses 20 relevant papers. (A good body of research for an undergraduate dissertation project style delivery).

The Viva

In the past, I have encouraged students to focus on primarily on the content that isn't included in their report as time is very limited (e.g. 15-20 minutes max). This would typically be:-

a) A short introduction (including context, identified problem(s), rationale, and methodology).
b) The software demonstration showcasing the software in action.
c) An attempt to highlight the "wow factors" or "key challenges/achievements of the work", including stressing the components that students have taught themselves (not taught in the course) and have learned to solve the challenging aspects of their dissertations.
d) A conclusion highlighting the test results/evaluation results, the overall outcomes of the project (e.g., has the problem been solved), and possible future work.

Based on the feedback provided this year, slight adjustments to this strategy are required, in order to emphasise the academic nature of the work.

The revised viva recommendation content is now:-

Recommended Structure of the Viva Presentation

Introduction (3 minutes)

- Brief Overview: Provide a concise overview of your project, including the problem statement, objectives, and significance of the work.
- Academic Underpinning: Mention the key theories and literature that underpin your project. Explain how these academic sources informed your project's framework.
- Key Highlights: Outline the unique or challenging aspects of your project that you will cover in detail during the demonstration.

Methodology and Rationale (3 minutes)

- Chosen Methodology: Clearly describe the methodology used in your project (e.g., Agile, Waterfall, hybrid). Justify why this methodology was suitable for your project.
- Literature Support: Cite relevant academic sources that support your chosen methodology. Explain how these sources influenced your methodological decisions.

Software Demonstration (8-10 minutes)

- Functionality and Features: Demonstrate the key functionalities of your software. Highlight the core features that address the problem you identified and how they work in practice.
- Technical Challenges and Solutions: Explain the technical challenges you encountered and how you overcame them, particularly emphasising the components you taught yourself.

Consider giving a short example of the section of code you are most proud of, to illustrate your understanding/coding skills.
- User Experience and Design: Showcase the user interface and user experience aspects of your software. Explain your design choices and how they enhance usability.
- Innovative Elements: Highlight any innovative features or technologies used in your project. Discuss why you chose these technologies and how they contribute to the overall effectiveness of your solution.
- Testing and Evaluation: Briefly demonstrate how you tested your software and any evaluation results that show its effectiveness and reliability.

Self-Learning and Skill Development (3 minutes)

- New Skills Acquired: Detail the skills and technologies you learned independently to complete your project. This might include new programming languages, frameworks, or tools not covered in your coursework.
- Application of Skills: Provide examples of how these new skills were applied to solve specific problems within your project.

Conclusion (2-3 minutes)

- Summary of Achievements: Summarise the main achievements of your project, focusing on how your software meets the objectives and addresses the initial problem statement.
- Future Work: Suggest potential future developments or improvements. This shows forward-thinking and a deeper understanding of the subject.

Key Points to Emphasise (Based on the 2023/24 feedback)

Academic Underpinning and Justification:

- Incorporate Theory: During the introduction, briefly mention the key academic theories and literature that form the foundation of your project. Explain how these informed your project framework.
- Support Methodology: In the methodology section, justify your chosen approach with references to academic sources. This demonstrates a well-grounded rationale for your methodological decisions.

Engagement with Literature:

- Critical Analysis: Mention any critical engagement with literature during the introduction and methodology sections. Discuss how the findings and methodologies from these sources influenced your project.
- Research Integration: Clearly link the insights from the literature to your own research, demonstrating how academic research supported your project decisions and development process.

Stress Testing and Evaluation:

- Highlight Testing: During the software demonstration and conclusion, emphasise the testing and evaluation you carried out. Provide specific examples of how your testing validated the effectiveness and reliability of your software. This evidence should directly support the success of your project.

Comprehensive Conclusion:

- Address Initial Problems: Ensure your conclusion addresses any initial project problems or questions. Provide evidence from your project to show how these issues were resolved. This demonstrates a thorough and reflective understanding of your work and its impact.

Target Audience:

- Academic Professionals: Remember that your target audience for this presentation is academic Professionals. It is not the normal key stakeholders/clients you deliver presentations to on challenge events or in simulation-based assignments. As such, you can use significantly more technical/professional language/concepts and assume these will be understood by the audience.

Aims and Objectives Advice

The aims and objectives section of your dissertation is critical as it sets the direction and scope of your research. This section should clearly articulate what you intend to achieve through your study and how you plan to accomplish these goals. Here's a detailed guide to ensure your aims and objectives are well-defined, aligned with your problem domain, and adhere to the SMART criteria.

Aims

Your aims should provide a broad statement of the desired outcomes of your project. They should reflect the overarching goals and the purpose of your study. A good aim should be:

Broad and Inclusive: It should encompass the entire scope of your research.

Clear and Concise: It should be easy to understand and free from ambiguity.

Relevant: It should directly relate to the problem you are addressing.

Example:

Aim: To develop and implement an integrated inventory management system to enhance operational efficiency and accuracy in Awochem's production processes.

Objectives

Objectives break down your aim into specific, actionable steps. They provide a clear roadmap for achieving your aim. Each objective should be:

Specific: Clearly defined and unambiguous.

Measurable: Quantifiable or assessable in terms of success or completion.

Achievable: Realistic given the resources and time available.

Relevant: Directly linked to the aim and aligned with the problem domain.

Time-bound: Specified with a clear timeline for completion.

Example:

Objective 1: To analyse the current inventory management processes at Awochem and identify key areas of inefficiency within the first month.

Objective 2: To design a prototype of the integrated inventory management system using modern software engineering practices by the end of the second month.

Objective 3: To implement the inventory management system within a six-month period, ensuring it integrates seamlessly with existing production workflows.

Objective 4: To conduct comprehensive testing of the system, including user acceptance testing, within the seventh month.

Objective 5: To evaluate the system's performance in improving operational efficiency and accuracy through a series of metrics and user feedback within two months post-implementation.

Objective 6: To provide training and support materials to Awochem staff to ensure a smooth transition and optimal use of the new system by the end of the project timeline.

Alignment with Problem Domain Review

Ensure your aims and objectives are based on your problem domain review. This involves:

Grounding Objectives in Research: Review literature and existing solutions to ensure your objectives are informed by current knowledge and practices.

Contextual Relevance: Align your objectives with the specific context of your research problem. For example, if your problem involves inefficiencies in inventory management, ensure your objectives address these inefficiencies directly.

Example:

Based on the literature review, which highlights common inefficiencies in inventory management systems (Smith, 2021; Johnson, 2020), your objectives should focus on these areas, such as reducing manual data entry errors and improving real-time inventory tracking.

Additional Considerations

Target Audience and Stakeholders: Identify who will benefit from your project outcomes and consider their needs in your objectives. For example, "To ensure the new system meets the operational needs of Awochem's staff and management."

Project Activities and Deliverables: List all activities and deliverables required to achieve your objectives. For example, "Deliverables include system design documents, a functional prototype, a final integrated system, testing reports, and training materials."

Estimated Time Scales: Provide a realistic timeline for each objective to ensure project milestones are met. For example, "The system design will be completed by the end of the second month, with full implementation scheduled for six months."

References:

Smith, J. (2021). Improving Inventory Management Systems. Journal of Operations Management.

Johnson, P. (2020). Challenges in Modern Inventory Systems. International Journal of Production Research.

Additional Reminders

Finally, the standard reminders for project report content, formatting and presentation: -

Abstract Support

Separate Page and Length: Your abstract should be on a separate page and relatively short, typically 150 to 300 words.

Content of the Abstract:

Introduction: Provide context for the research topic and outline its importance.

Objective or Purpose: Describe the main objective or purpose of the research.

Methodology: Provide a brief overview of the research methods used.

Results: Summarize the key findings or outcomes of the study.

Conclusion: Discuss the implications of the findings and their significance.

1. Introduction and Project Rationale

Clear Articulation of the Problem: Provide a succinct and clear description of the problem and context, including enough background information to make the problem understandable. For example, "In recent years, corporate manufacturing processes have suffered inefficiencies due to outdated technology, leading to increased costs and reduced output."

Effective Problem Identification: Clearly identify your problem, including the essential facets of the problem domain. For example, "The primary issue lies in the manual handling of inventory, which leads to errors and delays."

Justification and Rationale: Justify why the problem is worth solving, including the benefits of solving it. For example, "Addressing this problem will streamline operations, reduce costs, and enhance overall productivity." (Quantify identified improvements in the aims and objectives section if possible).

2. Stakeholder Analysis:

Know your Stakeholders: Identify and analyse the stakeholders who will be impacted by your project, including users, clients, sponsors, and other relevant parties. For example, "The primary stakeholders include the operations team, senior management, and our key clients who rely on timely deliveries."

Consideration of Stakeholder Needs: Consider the needs, expectations, and potential concerns of all stakeholder groups regarding the proposed solution. For example, "Stakeholders require a solution that is user-friendly, reduces error rates, and integrates seamlessly with existing systems."

3. Literature Review and Problem Domain Review

Review of Relevant Academic Papers: Review suitable academic papers relevant to the topic. For example, "Several studies have highlighted the impact of digital transformation on operational efficiency (Reis et al., 2020)." Use the Harvard referencing style within your report.

Examination of Existing Systems: Examine existing systems, solutions, and relevant technologies. For example, "Existing inventory management systems, such as XYZ, offer automated tracking but lack integration with our current software."

Summarised Relevance: for both academic literature and comparable systems, summarise the relevance of the material presented to your work. For example, "These studies provide a foundation for understanding the potential benefits and challenges of implementing an automated inventory system in our context."

4. Aims and Objectives

Appropriate Aims and Objectives: Ensure your aims and objectives are based on your understanding of the problem domain. For example, "To develop an automated inventory management system that integrates with existing operations to reduce errors and improve efficiency."

SMART Objectives: Ensure your objectives are Specific, Measurable, Achievable, Relevant, and Time-bound (SMART). For example, "To reduce inventory errors by 30% within six months of implementation."

5. Methodology

Justify Selection: Review several possible approaches to completing your project effectively. Critically appraise these methods and justify your final selection.

Outline of Steps: Outline the steps you will take to carry out your research or complete your project. For example, "The project will follow an Agile methodology, with iterative development and regular stakeholder feedback."

Provide academic support for your methodology selection: Use suitable academic references to help justify your methodology selection and show you researched your final approach thoroughly.

Techniques and Approaches: Clearly state and reference the techniques/approaches you plan to use. For example, "Use Case Diagrams will be used to model the user interactions for all the proposed system functionality (Booch et al., 1999)."

6. Key Challenges and Additional Knowledge Required

Identification of Challenges: Identify the most challenging or technically sophisticated parts of your Project. For example, "The integration of real-time data processing with legacy systems is a significant challenge." Highlight these points in your report and viva. You want to ensure the marking team understands how you have applied your new learning and developed skills during the dissertation journey.

Advanced Challenges: Ensure the challenges are significantly more advanced than those you have undertaken in previous coursework. For example, "Implementing a machine learning algorithm to predict inventory needs based on historical data." Getting a higher grade in the dissertation project is conditional on advanced challenges.

7. Tables and Figures Listing

Format and Placement: Include a tables and figures listing after the contents page.

Tables Listing: Provide a numbered list of all tables included in the dissertation, along with their titles and page numbers.

Figures Listing: Provide a numbered list of all figures used in the dissertation, along with their titles and page numbers.

Labelling:

Tables: Place the table label above the table, formatted in bold text.

Figures: Place the figure label below the figure, formatted in italicised text.

8. Good Sources for Additional References

Techniques and approaches: You can effectively increase your dissertation reference utilisation by providing citations for techniques, languages, or approaches used within your work. For example, "Significant Event Analysis (SEA) was carried out for the majority of key business processes (Holt & Perry, 1998)."

Minimum Target: Aim for 2-3 pages of references for a strong dissertation.

9. Conclusion

Reflection on Learning Experience: Reflect on what you have learned throughout the research process, including new skills acquired, challenges overcome, and insights gained.

Assessment of Research Outcomes: Discuss the strengths and weaknesses of your research, evaluating whether the original aims and objectives have been met and the extent to which the original problems have been solved.

Evaluation of Project Success/Failure: Provide evidence of the project's success or failure based on testing and evaluation results, presenting key findings, outcomes, or achievements.

Impact and Contribution: Discuss the potential impact of your research findings or project outcomes on the field of study, considering how your work contributes to existing knowledge and informs future research directions.

Reflection on Methodology: Reflect on the appropriateness and effectiveness of the research methodology employed, discuss any challenges faced during data collection or analysis, and consider alternative approaches.

Recommendations for Future Work: Propose suggestions for future research or enhancements to the project, identifying areas for further investigation, potential extensions of the study, or opportunities for improvement.

References

Booch, G., Rumbaugh, J., & Jacobson, I. (1999). The Unified Modelling Language User Guide. Addison-Wesley.

Holt, A., & Perry, M. (1998). Significant Event Analysis: A New Technique for Analyzing Complex Systems. Software Engineering Notes, 23(5), 40-49.

Gosling, J., Joy, B., Steele, G., Bracha, G., & Buckley, A. (2014). The Java Language Specification, Java SE 8 Edition. Addison-Wesley Professional.