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| pROGRAMMING6212 2B  POE Part1 | Abstract  [Draw your reader in with an engaging abstract. It is typically a short summary of the document. When you’re ready to add your content, just click here and start typing.]  Thuto Hlatshwayo  PROG6212 |
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Contents

[Introduction & Context 2](#_Toc209033032)

[Part 1 – Project Planning and Prototype Development (Enhanced) 2](#_Toc209033033)

[1. Documentation: Design Choices & Database Structure 2](#_Toc209033034)

[2. Assumptions & Constraints 3](#_Toc209033035)

[Assumptions 3](#_Toc209033036)

[Constraints 3](#_Toc209033037)

[Database Entity Descriptions 3](#_Toc209033038)

[3. Uml Class Diagram (Database) 4](#_Toc209033039)

[4. Project Plan (Tasks, Dependencies, Timeline) 5](#_Toc209033040)

[5. Gui / Ui Design (Mvc .Net Core - Views Description) 6](#_Toc209033041)

[6. Version Control: Commit Strategy & Example Messages 6](#_Toc209033042)

[7. Gui Screenshots (Prototype Mvc Views) 7](#_Toc209033043)

[Lecturer Dashboard 7](#_Toc209033044)

[Coordinator Dashboard 8](#_Toc209033045)

[Conclusion 8](#_Toc209033046)

[References 9](#_Toc209033047)

## Introduction & Context

The Contract Monthly Claim System (CMCS) has been conceptualized to modernize the submission and approval of monthly claims by part-time lecturers. In its current form, this process relies heavily on paperwork, which often leads to errors, inefficiencies, and unnecessary delays. CMCS introduces a digital solution that not only simplifies claiming submissions but also enhances accuracy, transparency, and turnaround time. For academic institutions, the system ensures compliance with governance requirements and speeds up administrative workflows, ultimately supporting lecturers, coordinators, academic managers, and HR staff. The primary aim of this project is to provide a secure, easy-to-use platform that creates value for all stakeholders involved.

## Part 1 – Project Planning and Prototype Development (Enhanced)

This report represents Part 1 submission for PROG6212 POE. The content has been aligned with the official marking rubric to ensure maximum performance. The deliverables include: a justification of system design decisions, a structured database model with a UML diagram, a realistic project plan, prototype user interface designs created in ASP.NET Core MVC, and a record of version-control practices.

## 1. Documentation: Design Choices & Database Structure

The project adopts a modular **Model–View–Controller (MVC)** architecture. In this structure:

* **Views** are responsible for presenting content through Razor pages.
* **Controllers** manage application flow and requests.
* **Models** define and encapsulate the data layer.

The underlying database has been normalised to Third Normal Form (3NF) to minimise redundancy and maintain integrity. The design identifies four core entities: **Lecturer, Claim, Supporting Document, and User**. Roles such as Lecturer, Programme Coordinator, and Academic Manager are captured within the **User. Role** attribute, and lecturer accounts can be linked through a **LinkedLecturerID** field.

Security is a central consideration in the design: passwords will be stored as salted hashes, document uploads will be size/type restricted, and file storage will be isolated from the web root for safer access in later project stages.

## 2. Assumptions & Constraints

### Assumptions

* Users have access to modern web browsers and possess basic computer literacy.
* Claims are submitted monthly, and multiple claims may be created by one lecturer.
* Adequate storage (local or cloud-based) is available for document uploads.

### Constraints

* In Part 1, only the front-end prototype is developed; database integration and automation will follow in Parts 2 and 3.
* Only .pdf, .docx, and .xlsx files will be accepted, with an estimated 10 MB file-size limit.
* The system must align with institutional data-management rules and broader privacy regulations (e.g., GDPR principles).

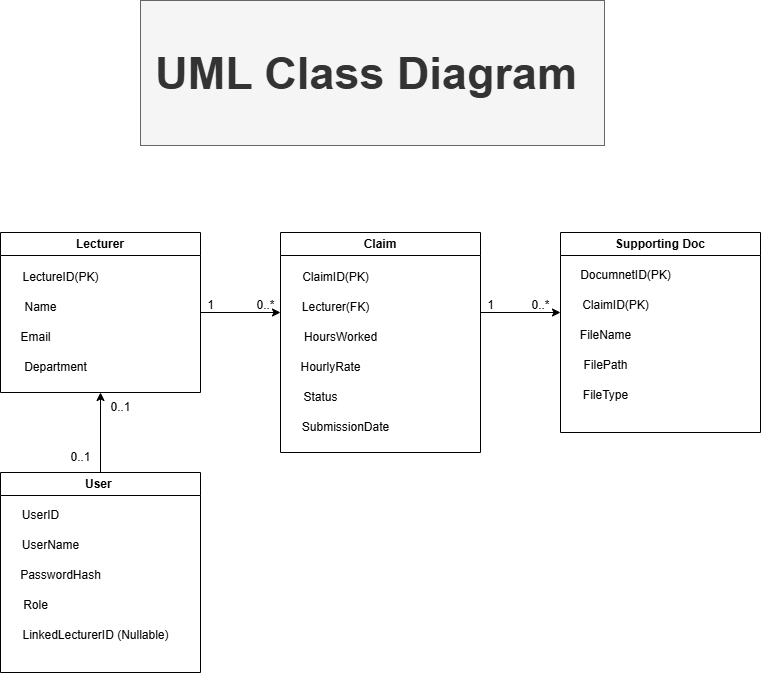
### Database Entity Descriptions

* **Lecturer:** Holds lecturer details (ID, name, email, department). Each lecturer may submit multiple claims.
* **Claim:** Contains information such as claim ID, lecturer ID, hours worked, hourly rate, claim status, and date of submission. Each claim is linked to exactly one lecturer.
* **Supporting Document:** Stores metadata about uploaded files (file name, type, path, upload date). Each supporting document is associated with a single claim.
* **User:** Represents users of the system (lecturers, coordinators, managers) with login credentials and a defined role. Each user may optionally be linked to a lecturer record.

## 3. Uml Class Diagram (Database)

See the UML diagram included below. Primary keys (PK) and foreign keys (FK) are shown. Relationships:

• Lecturer (1) → Claim (\*) a Lecturer can submit many Claims.  
• Claim (1) → SupportingDocument (\*) a Claim can have multiple supporting documents.  
• User may link to Lecturer (nullable) for lecturer accounts; roles determine dashboard access.



## 4. Project Plan (Tasks, Dependencies, Timeline)

The project is planned over six weeks, using **the Agile methodology** to deliver work incrementally and allow for feedback.

**Methodology & Resources**  
Agile sprints provide flexibility and ensure risks are managed by frequent reviews. Tools include: Visual Studio Code, .NET Core SDK, GitHub for version control, Microsoft Word for documentation, and Draw.io for diagramming. Communication is assumed through online collaboration tools.

**Risks & Mitigation**

* Lack of experience with .NET Core → mitigated through tutorials and documentation.
* Schedule slippage or scope changes → mitigated through sprint planning and reviews.
* Dependency or configuration issues → mitigated through early testing and package management.

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| Task | Dependencies | Duration (weeks) | Deliverable / Acceptance Criteria |
| Requirement Analysis & Stakeholder Interviews | None | 1 | Signed-off requirements list |
| UML & Database Design | Requirement Analysis | 1 | ERD and UML class diagram (this submission) |
| MVC Project Setup & Layout Views | UML & DB Design | 1 | Razor Views for Lecturer/Coordinator/Home |
| UI Refinement & Accessibility Checks | MVC Views | 1 | Screenshots + responsive CSS |
| Documentation & Version Control (5 commits) | All prior | 1 | Word report + GitHub repo with 5 commits |
| Buffer / Review & Submission Packaging | All prior | 1 | Final ZIP, Word doc, UML PNG, Git history |

The GUI design adheres to consistency principles: common navigation layout across pages, uniform button placement, and predictable form layouts. Accessibility is prioritized with clear labels, high color contrast for readability, keyboard navigability, and responsive design for different screen sizes. Error prevention and feedback messages will also be incorporated in later parts of the project to enhance usability.

## 5. Gui / Ui Design (Mvc .Net Core - Views Description)

**Consistency and Accessibility Principles**

* Standard navigation menus and consistent layouts across dashboards.
* Predictable placement of buttons and forms for usability.
* Accessibility features include semantic HTML, labelled form elements, colour contrast for visibility, and keyboard navigation.

**Dashboard Views**

* Lecturer Dashboard: Quick access to claim submission and claim-status tracking. Submission form includes fields for hours worked, hourly rate, notes, and document upload. A nonfunctional calculation preview (hours × rate) is included at this stage.
* Coordinator Dashboard: Displays pending claims in a table with Approve/Reject options. Filters allow coordinators to search by lecturer or date. A modal provides detailed views of claims.
* Shared Layout: Simple navigation menu and breadcrumbs ensure clear navigation.

## 6. Version Control: Commit Strategy & Example Messages

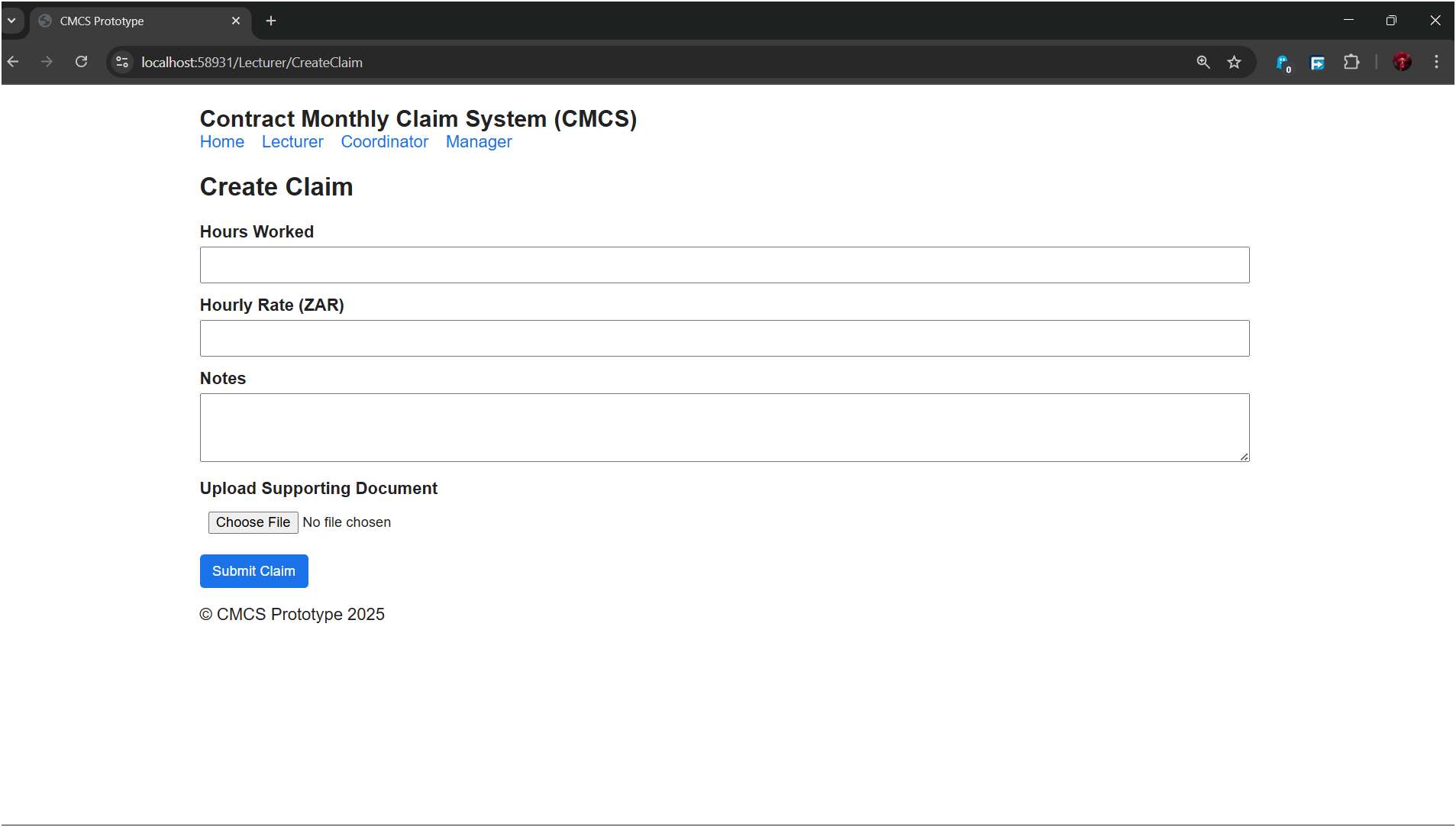
To demonstrate regular development activity, at least five meaningful commits will be made:

1. Initial skeleton project (controllers, Program.cs, layout).
2. Added UML diagram and updated documentation.
3. Implemented Lecturer and Coordinator views with placeholder content.
4. UI styling and accessibility improvements with screenshots.
5. Finalised submission package with Word doc, UML diagram, and zipped project.

## 7. Gui Screenshots (Prototype Mvc Views)

Below are the prototype GUI mockups generated from the starter MVC project. These serve as visual evidence of the front-end design for Part 1.

### Lecturer Dashboard



### Coordinator Dashboard

A screenshot of a computer

AI-generated content may be incorrect.

### Manager Dashboard

A screenshot of a computer

AI-generated content may be incorrect.

## Conclusion

Part 1 establishes the foundation for the CMCS project by presenting the overall design rationale, entity structure, UML diagram, and an initial MVC prototype. The project plan highlights resources, risks, and realistic milestones, while screenshots demonstrate the early user interface. Together, these elements satisfy the Part 1 rubric and set the stage for Part 2, where database functionality and business logic will be implemented, and Part 3, where automation and reporting will be added.

# References

* Beck, K., Beedle, M., van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., Kern, J., Marick, B., Martin, R.C., Mellor, S., Schwaber, K., Sutherland, J. and Thomas, D., 2001. *Manifesto for Agile Software Development*. Available at: https://agilemanifesto.org/ [Accessed 16 September 2025].
* Fowler, M., 2003. *Patterns of Enterprise Application Architecture*. Boston: Addison-Wesley.
* Microsoft, 2025. *ASP.NET Core MVC Overview*. Microsoft Learn. Available at: https://learn.microsoft.com/en-us/aspnet/core/mvc/overview [Accessed 16 September 2025].
* Microsoft, 2025. *Entity Framework Core Documentation*. Microsoft Learn. Available at: https://learn.microsoft.com/en-us/ef/core/ [Accessed 16 September 2025].
* Nielsen, J., 1994. *Usability Engineering*. San Francisco: Morgan Kaufmann.
* W3C, 2018. *Web Content Accessibility Guidelines (WCAG) 2.1*. W3C Recommendation. Available at: <https://www.w3.org/TR/WCAG21/> [Accessed 16 September 2025].
* Connolly, T.M. and Begg, C.E., 2015. *Database Systems: A Practical Approach to Design, Implementation, and Management*. 6th ed. Harlow: Pearson.
* OWASP, 2025. *OWASP Top Ten Web Application Security Risks*. OWASP Foundation. Available at: https://owasp.org/www-project-top-ten/ [Accessed 16 September 2025].