

Task 1

04 February 2026 10:27

Task 1: Ideation & Innovation (GAC2)

This task answer should be approx. 6-700 words with supporting IEEE citations.

Q.1: Innovation: Document a summary of **some of the areas/concepts from Topic 1 of Unit 1** on Moodle. The areas covered in the following **online topic** will help you to answer this question.

- **Online Topic:** Unit 1 Topic 1 - How Innovation Shapes the World. The role that creativity and innovation plays in the development of society and self.

Q.2: Ideation:

- Document **several project ideas** from areas of personal interest related to your programme of study. Then **select 1 project idea** that you would like to take forward.
- Document a **project title** (no more than 15 words), a **single Aim and several Objectives** and **brief description** of your project idea.

Q.3: Research:

- Search to discover and document 3-5 key **courses and sources** that will help you to achieve your project's Aim and objectives.

Project title	DevTrace - Agile-Based Bug Tracking & DevOps Management System
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE

The aim of the *DevTrace - Agile-Based Bug Tracking & DevOps Management System* project is to design and develop a web-based application that supports software dev teams in managing bugs, tracking project progress, and integrating DevOps practices within an Agile framework.

- The main objective of this project is to showcase the application of the software engineering principles, such as the analysis, system design, implementation, testing, and deployment, demonstrating the use of Agile methodology and modern development tools.
- The system should provide the following structured issues / features:
 - tracking
 - sprint management
 - real-time reporting dashboard
 - Smart Issue Priority Suggestion (Rule-Based AI)
 - Sprint Risk Indicator (Simple Analytics)
 - Suggests priority automatically
 - role-based access control to enhance collaboration
 - transparency
 - productivity in software dev environments
- The end goal is the system being able to consistently identify and track bugs while being able to incentivise collaboration

Project title	SmartTask - Intelligent Task Management System for Small Teams
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Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CS / SE

Task 2

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Task 2: Project Management (GAC3)

Your answers to the questions below should refer to a project/research area of your choice (related to your programme of study). The task answer should be approx. 6-700 words with supporting citations.

Q.1: Document the **Project scope** including: a proposed **solution** to your project aim, the **required Technologies/resources** to be used, a **project timeline** and **task schedule**.

Q.2: Using a software tool of your choice, create a **Gantt chart** to document your project stages.

Q.3: Identify some **risks/challenges** your project could face and document what you can do to reduce/remove them.

II. Proposed Solution

The proposed solution is to design and development of **DevTrace**, a web-based Agile-oriented bug tracking and DevOps management system intended to support software development teams in managing issues, monitoring sprint progress, and improving collaboration. The system aims to integrate issue tracking, sprint planning, and DevOps workflow visibility within a unified platform.

DevTrace will provide structured functionality for creating, assigning, prioritising, and resolving software defects and development tasks. The system will support Agile methodologies, specifically Scrum, by enabling sprint creation, backlog management, task estimation, and progress tracking through burn-down charts and performance dashboards.

The architecture of the proposed system will follow a layered design approach consisting of:

Presentation Layer – Responsible for the user interface and user interactions.

Business Layer – Handles application logic, validation, and workflow management

Data Access Layer - Manages database communication and persistent storage

Role-Based Access Control (RBAC) will be implemented to ensure that different users (admins, project managers, and developers) have appropriate permissions. Additionally, the system will provide integration capabilities with version control and continuous integration tools to enhance traceability between code commits and reported issues.

The development process will follow Agile principles, with iterative sprint cycles including planning, development, testing, review, and retrospective phases. This crucial in the continuous improvement of the project's lifecycle.

III. Required Resources and Technologies

The successful implementation of DevTrace requires appropriate software tools, development frameworks, infrastructure resources, and human inclusion.

A. Development Tools

- Integrated Development Environment (IDE): Visual Studio Code
- Version Control System: Git
- Repository Hosting Platform: GitHub

These tools will facilitate collaborative development, version tracking, and source code management.

B. Front-End Technologies

- HTML5
- CSS3
- JavaScript
- React.js framework

These technologies will be used to develop a responsive and interactive user interface, ensuring usability and accessibility.

C. Back-End Technologies

- Node.js runtime environment
- Express.js framework

The back end will implement RESTful APIs to manage system Ops, handle authentication, and process data transactions.

D. Database Management

- MySQL (Relational Database Management System)

The database will store user information, issue records, sprint data, and project metrics securely and efficiently.

E. DevOps and Deployment Tools

- Docker for containerisation
- Jenkins for Continuous Integration and Continuous Deployment (CI/CD)
- Cloud hosting environment (AWS)

These tools will support automated builds, testing, deployment pipelines, and scalable hosting.

F. Hardware and Human Resources

The project requires a development workstation with sufficient processing capability and internet connectivity. Human resources include:

- Student Developer (Project Implementation)
- Academic Supervisor (Project Oversight)
- Test Users (User Acceptance Testing Phase)

IV. Risk Management

Effective risk management is essential to ensure the successful delivery of the DevTrace system within the defined scope, time, and quality constraints. Risks were identified, analysed, and categorised based on their likelihood and potential impact on the project.

G. Risk Identification

The primary risks associated with the DevTrace project include technical, operational, and project management risks.

1. Technical Complexity Risk

Integration with version control systems and CI/CD tools may introduce unforeseen compatibility or configuration challenges.

2. Scope Creep Risk

Additional features beyond the initial requirements may be requested during development, potentially affecting deadlines.

3. Time Management Risk

As the project is conducted within an academic timeframe, poor time allocation across sprints may delay completion.

4. Security Risk

Improper implementation of authentication or role-based access control may result in weaknesses such as unauthorised access.

5. System Integration Risk

Integration with external tools (Git-based repositories or CI/CD pipelines) may cause API-related issues or service dependency failures.

A. Risk Analysis and Mitigation

<i>Risk</i>	<i>Likelihood</i>	<i>Impact</i>	<i>Mitigation Strategy</i>
Technical Complexity	Medium	High	Conduct early prototyping and proof-of-concept integration
Scope Creep	Medium	Medium	Define clear requirements and maintain a controlled product backlog
Time Constraints	High	High	Implement strict sprint planning and weekly progress reviews
Security Weaknesses	Medium	High	Apply secure coding practices and conduct testing (unit & integration testing)
Integration Failures	Low	Medium	Use well-documented APIs and perform staged integration testing

Continuous monitoring will be performed throughout the Agile sprint cycles. Risks will be reviewed during sprint cycles. Risks will be reviewed during sprint retrospectives to ensure proactive management and early corrective action.

Task	Start Date & End Date
Ideation	04/02/2026 – 11/02/2026
Aim and Objectives	Include dates here
Project outline: description & Key sources	Include dates here
Project scope: timeline & resources	Include dates here
Project Planning: Task schedule & Gantt chart	Include dates here
Risk Analysis	Include dates here
Development methodology selection	Include dates here
Design phase	Include dates here
Prototype Development / implementation	Include dates here
User Testing & feedback	Include dates here
Finish development work	Include dates here
Deployment planning	Include dates here
Reflection and Report writing	Include dates here

Task 3

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Task 3: Project Development method & Design work (GAC4)

Your answers to the questions below should refer to a project/research area of your choice (related to your programme of study). The task answer should be approx. 6-700 words with supporting citations.

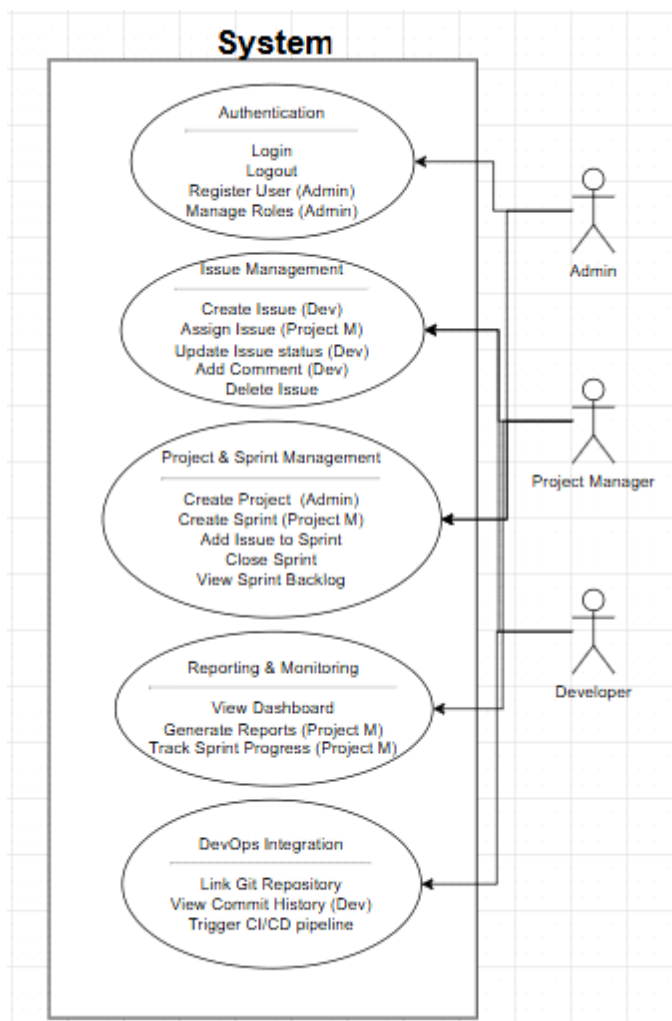
Q.1: Describe a suitable **Development method** that will help you plan and complete your project.

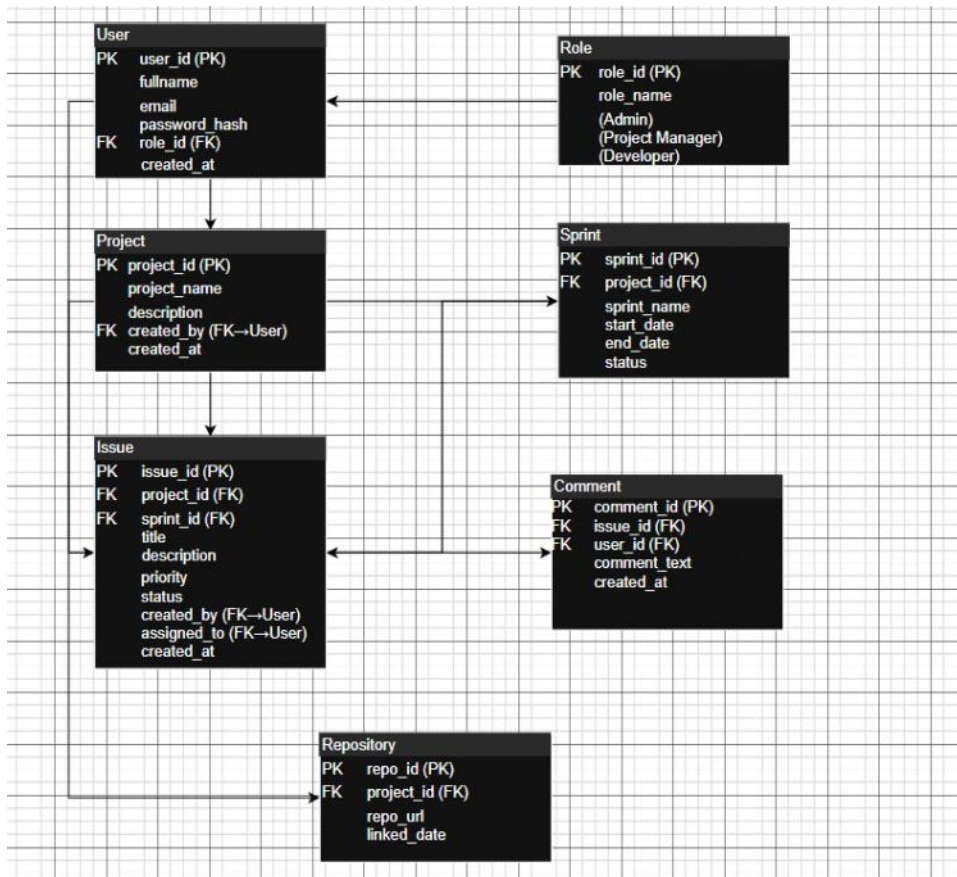
Q.2: Document and describe some project '**design work**'. 2 pieces required, e.g. depending on the nature of your project example design work could include: a requirements specification, sketches/drawings, storyboard, wireframes, flow chart/UML diagram, ERD data structure, network structure diagram, network security architecture/diagram.

Q.3: Use several screenshots with brief description to document some **initial practical implementation** work for your project.

1. For the beginning stages, I would choose the Waterfall method due to its straightforward approach in following a set make up of steps in order to have a structured timeline. Later on, I would switch to an Agile method, specifically Scrum Methodology so the project can be more flexible to account for unprecedented issues, which could also affect the designated timeline for each assignment for the project.

2.

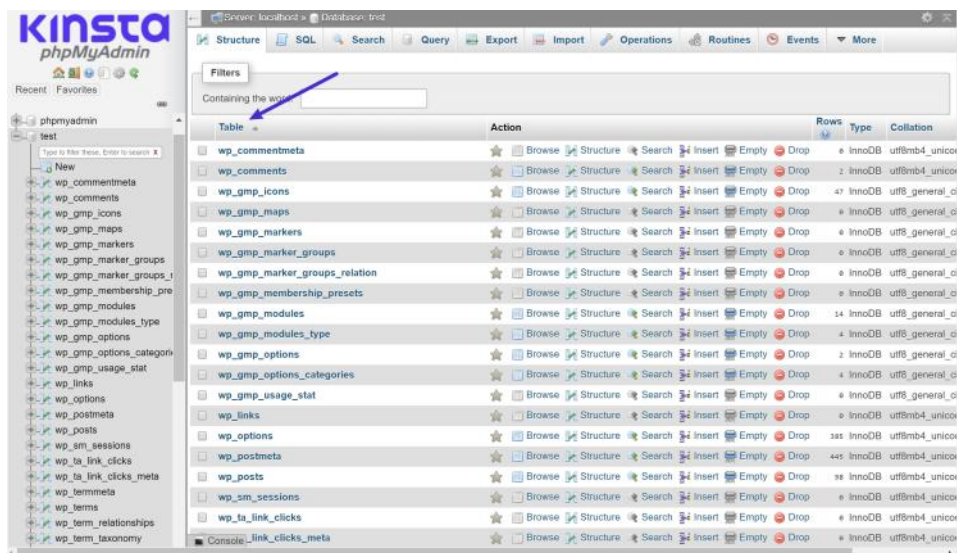




3.

The screenshot shows the GitHub repository page for 'fewer-tags' by user 'jdevalk'. The repository is public and has 13 stars and 1 fork. The main content area displays a list of files and their commit history, including .github/workflows, .wordpress-org, src, tests, .distignore, .gitattributes, .gitignore, .phpcs.xml.dist, LICENSE, README.md, composer.json, composer.lock, fewer-tags.php, phpunit.xml.dist, and readme.txt. The right sidebar contains information about the repository, including a description, a link to the plugin's blog, and a list of contributors (jdevalk and ken-ll).

GitHub Repository (example)



Mysql db (example)

Log in

to start learning

Twitter handle

✓

Password

Forgot password?

Log in →

Don't have an account? Sign up now!

Login page (example)

Issue: Bug Report

Create a report to help us improve

No template content.

Optional additional items

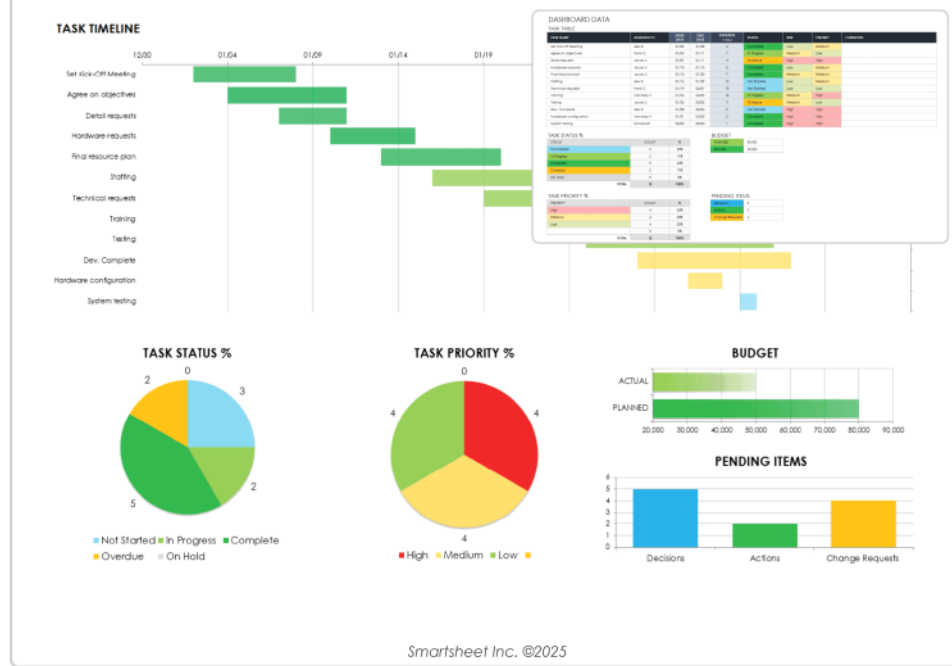
Issue default title: bug

Assignees:

Labels:

"Create Issue" Form (example)

Project Management Dashboard Template Example



Dashboard with Issue Counts (example)

References

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GOV.UK

D. for, “AI Skills for Life and Work: General Public Survey Findings,” *GOV.UK*, Jan. 28, 2026.
<https://www.gov.uk/government/publications/ai-skills-for-life-and-work-general-public-survey-findings/ai-skills-for-life-and-work-general-public-survey-findings>

Voice Assistants and Everyday Use

Malodia, S., Islam, N., Kaur, P., & Dhir, A., “Why Do People Use Artificial Intelligence (AI)-Enabled Voice Assistants?”, *IEEE Transactions on Engineering Management*, (2021). This study examines how voice assistants like Siri are used for everyday tasks and why users find them useful — including convenience and task completion.

Voice Assistant Technology Development

IEEE has published work related to the development and integration of voice assistant systems within larger technical frameworks (e.g., query reformulation and NLP improvements for virtual assistants).

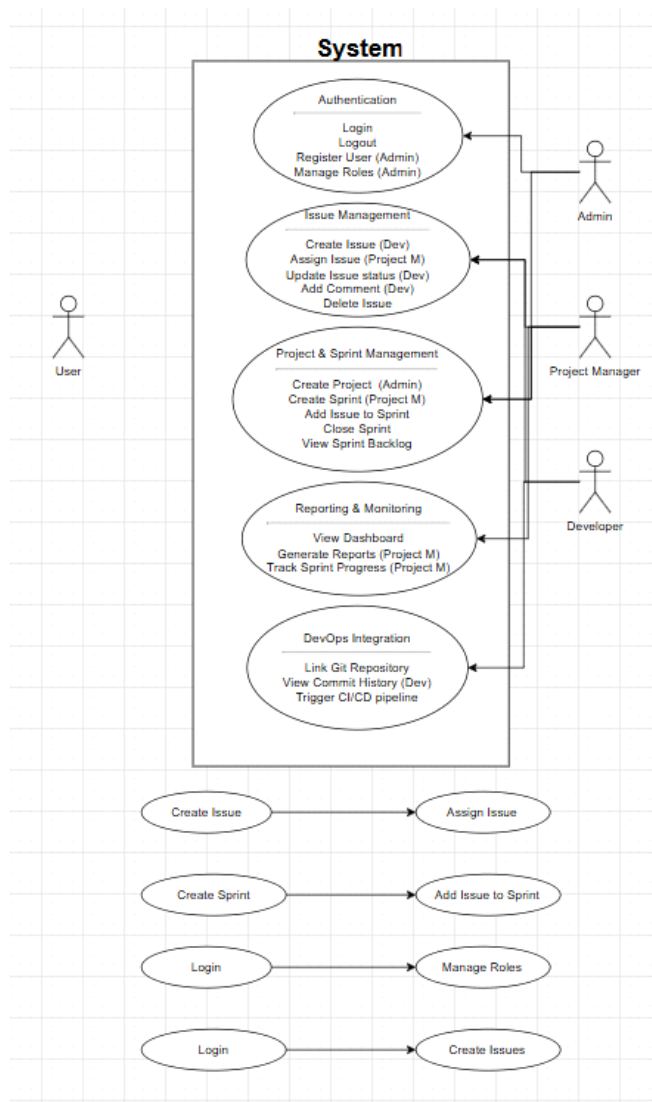
Security / Privacy Trade-Offs (relevant context even if not IEEE)

Research surveys show that voice assistants raise important privacy and security concerns — something you could mention as part of deeper evaluation of how AI helps versus what trade-offs exist.

S. Malodia, N. Islam, P. Kaur, and A. Dhir, “Why Do People Use AI-Enabled Voice Assistants?”, *IEEE Trans. Eng. Manage.*, 2021.

Appendix

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Administrator connects to:

Register User

Manage Roles

Create Project

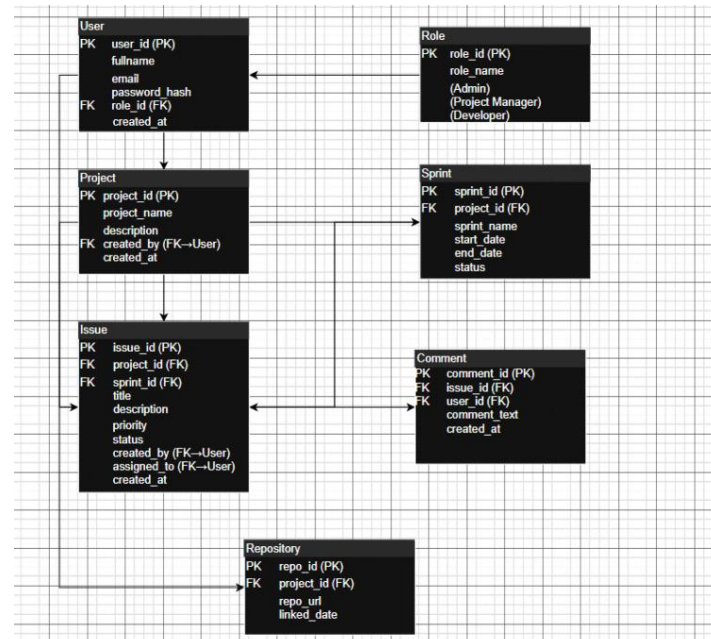
Project Manager connects to:

Create Sprint

Assign Issue

Generate Reports

Track Sprint Progress



Role → User

One Role

→ Many Users

(1:M)

User → Project

One User creates

→ Many Projects

(1:M)

Project → Sprint

One Project

→ Many Sprints

(1:M)

Project → Issue

One Project

→ Many Issues

(1:M)

Sprint → Issue

One Sprint

→ Many Issues

(1:M)

Track Sprint Progress	→ Many Issues (1:M)
Developer connects to:	Issue → Comment
Create Issue	One Issue → Many Comments (1:M)
Update Issue Status	
Add Comment	User → Issue
View Commit History	One User → Many Created Issues One User → Many Assigned Issues (Two separate relationships)
	Project → Repository
	One Project → One Repository (1:1)