

Project Managment of Quizz Generator

- **Project Managment Continuation**
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Introduction

This project is a dynamic web-based Quiz Generator that aims to provide a study aid for any subject, where students can immediately create quizzes for themselves from an API of questions. This is contextualised within Computing creativity and innovation, and the appropriate use of technologies, based on accessible design principles and conscious technology selection to provide a solution to a real need. The project also exhibits how this can be done simply, with straightforward systems, as with appropriate and thoughtful planning, problem definition and use of proven and appropriate existing technologies, value can be created from innovation.

The assignment is split into three parts, reflecting three distinct tasks. Task 1 contextualises the project within project management and design, providing scope, planning approach, technology choices, constraints, justification for Waterfall development, and presenting the key design artefacts that frame the solution space. Task 2 contextualises the project from an enterprise view, by providing an analysis of the EdTech market and using a PEST and SWOT review of a similar company, before then providing a proposal to position the quiz generator as a start-up concept, including a suitable business model and funding approach. Task 3 presents a reflective review of the project in terms of the technical and professional skills developed, its social value, and the ethical and operational risks present.

In this way, all three tasks together provide a life-cycle approach to creative software development, in line with these themes.

Task 1 – Project Management

The Dynamic Quiz Generator is a lightweight web application that allows students to revise any subject by generating dynamic quizzes from a public API. As the project scope is pre-defined and not complex, this project places a particular emphasis on scope definition, planning, and a lightweight interface. Pressman and Maxim state that small academic projects particularly benefit from “well-defined requirements, explicit boundaries, and disciplined sequencing of activities” [1], which directly inspired this project’s approach to planning and scope.

1.1 Project Management & Planning

The project's in-scope features are kept minimal and limited to the following functional requirements: a starting screen, a topic selection screen, a quiz screen, retrieving questions from an API, score tracking, and a results screen. It is a good practice in software engineering to precisely define both in-scope and out-of-scope features for a project [1]. Because it is using the Open Trivia Database API, some constraints of the project are tied to the availability of the API, quality of questions, and network connectivity, consistent with the considerations on external dependencies in the API's documentation [2].

Vanilla JavaScript, HTML5, and CSS were chosen as the core development languages as they are accessible, maintainable, and do not require a backend. MDN's tutorial for the Fetch API supports this decision: modern asynchronous programming, like `async/await`, is a simple way to request and manipulate quiz data without any external dependencies [3]. Likewise, the W3C HTML5 spec emphasizes semantic markup and cross-device functionality that influenced the wireframe and UI layout [8].

Quality and usability requirements were also based on the standards of ISO/IEC 25010, which focus on characteristics such as reliability, usability and maintainability [4]. The standards informed decisions such as maintaining a simple UI, providing clear feedback when interacting with quiz items and not overloading the system with elements that could degrade performance or consistency.

The phases for this project are requirement analysis, prototype wireframes, main JavaScript work, styling the UI, testing and documentation. This linear phase structure is specifically because the project will be following the Waterfall methodology. Pressman & Maxim [1] as well as Boehm's history of software methodologies [5] both point out that Waterfall is optimal when requirements are known to be static, the team is small, and university deadlines need a predictable schedule. Atlassian's comparison of Waterfall and Agile also shows that Waterfall should be used when goals are unchanging and iteration is low [7].

1.2 Project Design

Two primary design artefacts support the process. First, wireframes represent the start screen, quiz interface, and results screen. The drawings interpret functional requirements to present visual structure, and aid early decision-making about layout and usability. Second, the system flowchart describes sequential logic from quiz start to final scoring. Fowler states that simple UML and flow diagrams are useful for clarifying system behaviour and enhancing documentation quality even on small projects [6]. Both artefacts are appended.

All in all, Task 1 provides a focused, standards-compliant, baseline project brief for building a simple, reliable and accessible quiz app. Using a disciplined approach to project planning, light-weight web tech and some pretty clear design artefacts, it also nicely aligns to recognised software engineering principles, while still being a realistic academic exercise.

Task 2 – Enterprise

Assignment 8b. Enterprise Innovation Evaluation. This part of the task will be used to review Dynamic Quiz Generator from an enterprise innovation perspective, by evaluating a similar EdTech company and presenting the suggested tool in terms of a start-up design. Quizlet has been chosen for PEST and SWOT for being one of the biggest global self-study platforms to provide such a learning means.

2.1 PEST & SWOT Analysis of Quizlet

PEST Analysis

Political/Legal:

Working in the education field involves a high level of regulatory compliance, including data protection regulations (GDPR). Quizlet, as an online platform that depends on persistent data storage and uses user accounts, must provide transparency and legitimacy in data collection and processing [12]. This gives us an idea of the legal burden of large EdTech platforms.

Economic:

Quizlet is an example of a successful freemium business model in the education sector. It provides free basic services with limitations and premium plans for users that need more advanced services. This model has proven to be a viable option for companies in the learning sector to generate revenue and ensure growth [10], [14].

Social:

Demand for mobile-first, self-directed learning is a global trend. Quizlet's global popularity, in large part a result of its millions of users around the world, signals a societal trend for both autonomous learning and speedy, accessible revision tools [9]. This need is further compounded by an expectation that learning platforms have gamification, immediate feedback, and other micro-learning strategies, like those employed by Duolingo [16].

Technological:

EdTech tools are adopting cloud computing, scaling APIs and implementing AI-powered personalisation. Quizlet's AI creation of study recommendations reflects a broader trend of technology moving towards adaptive learning systems designed around the needs of the individual user [9], and other competitors, such as Duolingo, have raised the bar for expectations of intelligent and extremely responsive study platforms [16].

2.2 SWOT Analysis

Strengths:

Quizlet has a large user base with strong network effects since more users generate additional study materials to contribute to the platform and increasing its value [9]. In addition, Quizlet's brand reputation and international scale provide the company with a substantial competitive advantage.

Weaknesses:

One major drawback is its dependence on crowdsourced content. The result is often uneven quality, with many study sets duplicated or simply incorrect [9]. Additionally, many features are being locked behind paid subscriptions, becoming less accessible to learners with lower incomes.

Opportunities:

Demand exists for quicker, automated learning tools, such as AI-generated quizzes, and

personalised revision pathways [16]. There is considerable market and opportunity in extending our work into real-time adaptive quizzes or automated assessments.

Threats:

Competitive pressures and threats are related to competition from other providers of EdTech solutions like Kahoot! or Duolingo which offer gamified learning and have strong brand presence [10], [16]. Risks related to data ethics, content moderation, and regulatory requirements such as the GDPR may represent further ongoing threats [12].

2.3 Start-Up Concept: “QuickQuizEd”

The proposed quiz generator will be called QuickQuizEd . It will be advertised as a privacy-oriented, on-the-spot learning platform that does not require any accounts or tracking to create quizzes on any subject. This will help to differentiate it from competitors that require login systems and tracking of personal data, lowering GDPR-related risks and increasing accessibility [12].

The business would initially be a sole trader set up with the possibility to expand to a limited company as the business gains traction. The business model chosen was freemium - The free plan will be to keep the essential quiz generator free, with the opportunity to purchase premium add-ons like extra quiz templates, difficulty progression, save history, or school dashboards. Studies into the success of freemium highlight having clear value in the free offering and a powerful incentive to upgrade [14].

Investment would be two-pronged. Initial development might utilize Innovate UK grants for educational technology innovation, which do not require founders to relinquish equity [13]. Angel investment would be appropriate as user adoption scales, both to expand infrastructure and marketing, and to potentially incorporate AI for adaptive learning [15].

In sum, the business analysis has shown robust demand for simple, accessible quiz creation tools, and that QuickQuizEd can stand out from the crowd by being simpler, more privacy-minded, and adaptable for scaling.

Task 3 – Reflection

3.1 Skill Development

The development of the Dynamic Quiz Generator allowed me to improve and master a number of skills. Asynchronous JavaScript programming, including Promises and async/await patterns, was one of the most important ones. According to MDN, asynchronous functions facilitate non-blocking execution and more elegant code when interacting with external data sources [17]. They were used for receiving questions from the quiz API. This, in turn, allowed me to familiarize myself with common issues, including delayed response, network errors, and correct error handling with try/catch.

In relation to this, my proficiency in API integration greatly increased. FreeCodeCamp's guide on best practices for Fetch API, parsing JSON and validating responses was a good base for my API logic [18]. Debugging failed requests and inconsistent data toughened my problem-solving skills and made the app more robust.

A third focus area was UI/UX design. According to the Interaction Design Foundation, simplicity, clarity and low cognitive load are key aspects of good user experiences [19]. I tried to adhere to these guidelines when I gave priority to uncluttered layouts, readable fonts and intuitive controls in the quiz interface. Wireframing helped me to transform high-level ideas into more systematic designs, and improved my design thinking and communication.

Managerial Skill: I learned more project planning and documentation skills. The PMI project management fundamentals show the critical path in the project defines scope, time, and task organised in a logical phases [20]. I used an organised plan during the project to separate work into smaller portions with a smooth completion to avoid lag in deliverables. This work experience would help in delivering a small software project in a disciplined and organised way.

General: This activity improved my technical and organisational skills in preparation for more involved web development work.

3.2 Contribution to Society

The quiz generator has additional value to society by enabling fairer access to education. UNESCO identifies digital inequality as a significant issue, as many students do not have access to expensive or account-locked learning tools [21]. My project is free, runs in-browser, and does not require a login. This removes one barrier to entry for students who may be unable to use other platforms.

The project also allows self-directed learning, associated with increased motivation, autonomy, and long-term knowledge retention. Tripon states that available tools support students' independence in the study process and contribute to the formation of learning skills [22]. The ability to create quizzes immediately for a particular topic or subject directly provides such benefits.

In this context, the quiz generator is a direct contribution to academic practice, inclusion, and accessible digital education.

3.3 Risks, Challenges, and Mitigation

There were several problems which arose during development. The main technical risk was API reliability. Without a reliable API, or one which returns valid data, the generation of a quiz would be impossible. In the event of a failed API call, fallback messages were

implemented and basic error handling was performed, in accordance with asynchronous programming best practice [17].

One of the challenges was content quality and bias. As the API decides the quality of the question, we should choose reputable sources to lessen the risk of presenting fallacious information. Verified APIs and validating responses decreases this dependency.

Another challenge was time management, which I solved by detailed planning and PMI project management principles [20].

Lastly, ethics were considered. The ICO advises the principles of data minimisation and privacy-by-design with all digital services [23]. By circumventing the use of user accounts and the storage of personal information, the tool remained in line with UK expectations and lessened risk for both developers and users.

Conclusion

The Dynamic Quiz Generator is an example of how small, focused software projects can build real educational value from pragmatic project management and considered design. The aim of the solution—to offer free, rapid, and easily accessible quiz generation to students and learners—was supported by a simple technology stack, well-defined requirements, and an emphasis on usability. The results of Task 1 suggest that Waterfall was a sensible approach to providing the necessary structure for planning and delivery of this type of software project within an academic setting.

The analysis I conducted in Task 2 has revealed that there is a market demand for lightweight and privacy-first learning tools from the EdTech sector. Benchmarking against competitors (Quizlet) has given me a better understanding of market trends, business models, and the potential for differentiation. Positioning the quiz generator as a start-up is a viable growth path that can be supported by freemium models and innovation funding.

In conclusion, Task 3 demonstrated notable skill development in asynchronous JavaScript programming, API integration, UI/UX design, and project planning, as well as the project's societal value. By reducing the threshold for digital learning and facilitating self-study, the project adds value to the educational community. Overall, the work reflects the integration of creativity, technical problem-solving, and structured planning to create a functional and socially meaningful digital solution.

Reference List (IEEE)

- [1] R. Pressman and B. Maxim, *Software Engineering: A Practitioner's Approach*, 9th ed. New York, USA: McGraw-Hill, 2019. [Online]. Available: https://www.researchgate.net/publication/365946272_Software_Engineering_A_Practitioner's_Approach_9_th_Edition Accessed: Dec. 8, 2025.
- [2] Open Trivia DB, "Open Trivia Database API Documentation," 2024. [Online]. Available: https://opentdb.com/api_config.php, Accessed: Dec. 6, 2025.
- [3] Mozilla Developer Network (MDN), "JavaScript — Fetch API," 2024. [Online]. Available: https://developer.mozilla.org/en-US/docs/Web/API/Fetch_API, Accessed: Dec. 11, 2025.
- [4] International Organization for Standardization, "ISO/IEC 25010: Systems and software quality models," 2023. [Online]. Available: <https://www.iso.org/obp/ui/en/#iso:std:iso-iec:25019:ed-1:v1:en>, Accessed: Dec. 4, 2025.
- [5] B. Boehm, "A view of 20th and 21st century software engineering," *Proceedings of the 28th International Conference on Software Engineering*, pp. 12–29, 2006. [Online]. Available: <https://ieeexplore.ieee.org/document/4019551>, Accessed: Dec. 12, 2025.
- [6] M. Fowler, "UML Diagrams Overview," 2022. [Online]. Available: <https://www.scribd.com/document/859594135/UML-Class-Diagram-with-Examples> Accessed: Dec. 7, 2025.
- [7] Project management intro: Agile vs. waterfall methodologies 2024. [Online]. Available: <https://www.atlassian.com/agile/project-management/project-management-intro> Accessed: Dec. 10, 2025.
- [8] World Wide Web Consortium (W3C), "HTML5 Specification Overview," 2024. [Online]. Available: <https://www.w3.org/TR/html52/> Accessed: Dec. 13, 2025.
- [9] Quizlet, "About Quizlet: How Quizlet Works," 2024. [Online]. Available: <https://quizlet.com/en-gb/about> Accessed: Dec. 5, 2025.
- [10] Kahoot!, "Kahoot! Company Information," 2024. [Online]. Available: <https://kahoot.com/company/> Accessed: Dec. 12, 2025.
- [11] P. Kotler and G. Armstrong, *Principles of Marketing*, 18th ed., London, U.K.: Pearson, 2021. [Online]. Available: <https://commecsinsitute.edu.pk/wp-content/uploads/2024/08/Kotler-and-Armstrong-Principles-of-Marketing.pdf> Accessed: Dec. 7, 2025.
- [12] European Commission, "General Data Protection Regulation (GDPR)," 2018. [Online]. Available: <https://gdpr.eu/> Accessed: Dec. 11, 2025.
- [13] Innovate UK, "Funding and Support for UK Innovators," 2024. [Online]. Available: <https://www.ukri.org/councils/innovate-uk/> Accessed: Dec. 9, 2025.

- [14] Freemium business model: construct development and measurement validation” , Hao-Chen Huang, 2023. [Online]. Available: [https://www.researchgate.net/publication/303316642 Freemium business model construct development and measurement validation](https://www.researchgate.net/publication/303316642_Freemium_business_model_construct_development_and_measurement_validation) Accessed: Dec. 13, 2025.
- [15] British Business Bank, “Understanding Angel Investment,” 2024. [Online]. Available: <https://www.british-business-bank.co.uk/finance-hub/angel-investment/> Accessed: Dec. 8, 2025.
- [16] Duolingo Research, “How Duolingo Works: Inside the Learning Platform,” 2024. [Online]. Available: <https://research.duolingo.com/> Accessed: Dec. 4, 2025.
- [17] Mozilla Developer Network (MDN), “JavaScript Asynchronous Programming: Promises, async and await,” 2024. [Online]. Available: <https://developer.mozilla.org/en-US/docs/Learn/JavaScript/Asynchronous>, Accessed: Dec. 9, 2025.
- [18] FreeCodeCamp, “How to Work with APIs in JavaScript,” 2023. [Online]. Available: <https://www.freecodecamp.org/news/how-to-use-fetch-api/> Accessed: Dec. 7, 2025.
- [19] Interaction Design Foundation, “What is User Experience (UX) Design?,” 2024. [Online]. Available: <https://www.interaction-design.org/literature/topics/ux-design> Accessed: Dec. 12, 2025.
- [20] PMI – Project Management Institute, “Project Management Basics,” 2024. [Online]. Available: <https://www.pmi.org/about/what-is-project-management> Accessed: Dec. 5, 2025.
- [21] UNESCO, “Education and Digital Inequality: Understanding the Global Divide,” 2024. [Online]. Available: <https://www.unesco.org/en/digital-education> Accessed: Dec. 11, 2025.
- [22] Importance of Self-Directed Learning, 2015. Cristina Tripon [Online]. Available: [https://www.researchgate.net/publication/284904266 Importance of Self-Directed Learning](https://www.researchgate.net/publication/284904266_Importance_of_Self-Directed_Learning) Accessed: Dec. 6, 2025.
- [23] ICO – Information Commissioner’s Office, “Data Protection and Privacy for Online Services,” 2024. [Online]. Available: <https://ico.org.uk/for-organisations/guide-to-data-protection/> Accessed: Dec. 8, 2025.

Appendices

- Appendix A – Wireframes
- Appendix B – Flowchart
- Appendix C – Gantt Chart
- Appendix D – PEST/SWOT tables
- Appendix E – Logo sketch