# Statement of work(SOW)

CBE education
Version 1.0 - 2nd Aug 2024

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## 2. Background

### Background

In the higher education environment, teaching staff need access to a vast array of educational resources, management tools, and policy information. The real issue here is that there is often no such user-friendly platform for academics. Existing platforms and tools are often complex and difficult to use, especially for users without a technical background. Additionally, it is important that the website is designed to be easy to maintain for the university's professional staff. Teaching staff frequently face challenges in finding effective resources and managing educational content, which not only affects teaching quality but also increases their workload.

To address these issues, our project aims to create an interactive website that serves as a dynamic educational hub for teaching staff. The platform will feature a user-friendly interface, allowing individuals without a technical background to easily access and use it. By incorporating advanced features like an AI-powered chatbot, the website will facilitate real-time interaction and provide instant responses to common educational queries. Key modules will include Learning Management System (LMS) guides, education seminars, and assessment coordination, alongside governance tools that align with ANU's policies and academic integrity principles.

## Scope of Work

### Project Deliverables

1. **Interactive Website**:
    - Design and development of a user-friendly website with intuitive navigation and accessibility features.
    - Integration of educational resources, administrative tools, and policy information.
    - Implementation of key modules such as Learning Management System (LMS) guides, education seminars, and assessment coordination tools.
2. **AI-Powered Chatbot**:
    - Development and integration of an AI chatbot to handle educational inquiries and provide instant responses.
    - Collection and preprocessing of data for training the chatbot.
    - Ongoing training and optimization of the chatbot to improve accuracy and user satisfaction.
3. **Backend and Frontend Development**:
    - Setup of the server environment and database configuration.
    - Development of backend infrastructure including API endpoints.
    - Creation of frontend components and integration with backend services.
    - Ensuring data synchronization between frontend and backend.
4. **Data Management**:
    - Integration and analysis of existing data sources.
    - Collection, cleaning, and preprocessing of data to prepare training and test sets for the chatbot.
    - Ensuring data security and compliance with ANU policies.
5. **Security and Compliance**:
    - Implementation of security measures such as data encryption, firewall configuration, and regular security updates.
    - Adherence to ANU's security policies and procedures.

    - Use of licensed plugins and tools to enhance security, reliability, and performance.
6. **Documentation and Training**:
    - Creation of comprehensive user guides and training materials.
    - Development of a maintenance and update plan to ensure the long-term sustainability of the website.
    - Provision of detailed project documentation including technical specifications, risk logs, and reflection logs.

# 3. Timeline and project milestones

| Deliverables | Project Milestones | Start Week | End Week | To-Do List |
|---|---|---|---|---|
| - Landing page<br>- Documentation Pack | - Project Initiation<br>- Completion of Audit1 | Week2 | Week3 | - Landing page<br>- SoW<br>- Team Charter<br>- Reflection Log<br>- Risk Log<br>- Related Documents etc. |
| -Backend Setup<br>-Frontend Development<br>- Data doc. | - Backend Infrastructure Setup<br>- Initial Frontend Implementation<br>- Data Preparation Completion | Week3 | Week5 | - Investigate and compare current technologies<br>- Propose the best solution to the client<br>- Set up server environment, configure database<br>- Develop initial API endpoints<br>- Integration and analysis of existing data sources.<br>- Set up frontend environment<br>- Develop core UI components<br>-Collection of FAQ and answer data for training.<br>- Cleaning and preprocessing of data to prepare training |

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|---|---|---|---|---|
| | | | | and test sets. |
| - Data Integration<br>- Model Experimentation doc. | - Data Integration Completion<br>- Model Selection | Week5 | Week6 | - Integrate frontend with backend APIs<br>- Integrate data from various sources<br>- Ensure data synchronization between frontend and backend<br>- Test data flow and consistency<br>- Select and experiment with different NLP models. |
| - Feature Development<br>- Training and Optimization doc. | - Core Feature Implementation<br>- Model Training<br>- Preliminary Experiments<br>-Initial Optimization | Week6 | Week8 | - Develop additional features as per requirements<br>- Optimize performance and user experience<br>-Start training and validation of the base model.<br>-Refine and optimize selected models. |
| - System Testing doc. | - System Integration and Testing | Week8 | Week10 | - Integrate front-end and back-end services.<br>- Perform system testing<br>- Test use and gather feedback |
| | - Further Optimization | Week10 | Week11 | -Further optimization of the model. |
| - Website Release | - Initial Release | Week11 | Week12 | - Initial Release and Evaluation. |

# 4. Resources, risks management, potential costs

## **4.1** Resources

### Team Structure

- Leader & Project Manager: Overall project planning, communication with stakeholders and project teams.
- Front-end developers: Designing and implementing the user interface, ensuring the application is responsive and interactive across different devices and platforms.
- Back-end developer: Server-side logic, API development, and ensuring the application's data processing is secure and efficient.
- Database Administrator: Designing, optimizing, and maintaining the database to ensure data integrity, security, and performance.
- NLP Engineer: Developing and optimizing AI models.
- Tester: Perform system testing and collect users feedbacks.
- Documentation Specialist: Responsible for overseeing all documentation efforts within the project. Each team member contributes to the documentation tasks periodically.

### Software & Tools

- Development Environments & IDEs：
  - Visual Studio Code， PyCharm， Jupyter Notebook etc.
- AI and ML Frameworks
  - TensorFlow, PyTorch, Scikit-learn etc.
- Technology Stack:
  - Frontend: HTML, CSS, JavaScript, React,Vue.js,Bootstrap
  - Backend: Node.js, Express.js, java
  - Database: MongoDB or MySQL, Firebase
  - CMS: WordPress with Gutenberg editor, Greenshift block plugins, Greenshift FSE theme
  - Hosting: ANU's WPEngine platform

### Hardware

- Cloud Service Platform
  - Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP) etc.
- AI processor
  - NVIDIA GPU, Google TPU etc.

## 4.2 Potential Costs

- Domain name and Hosting Services:  Free
- API cost： 200 AUD

- Maintenance and Updates:  200AUD
- Security Measures: Free
- SSL certificate: Free
- Miscellaneous Costs:  20AUD

Total cost for this project: 420 AUD

## 4.3 Risk Management

In terms of technical risks, there is a risk of inadequate model performance, where the AI model may not achieve the expected accuracy, leading to a decline in user experience. To cope with this risk, extensive model testing should be conducted at the initial stage, the optimal model can be selected, and multiple datasets can be utilized for model training and validation. If the model still fails to meet the expected accuracy, adopting more advanced model architectures or other methods to resolve this issue.

Potential risks also include Advanced Feature Limitations. Due to security measures imposed by ANU, there might be restrictions that prevent the implementation of some advanced features in the AI system. Planning for alternative solutions or adjustments in the project scope may be necessary to address these constraints.

In terms of data and privacy, there is also a risk. Sensitive data may be illegally accessed or leaked during transmission or storage. Data transmission and storage can be protected by implementing end-to-end encryption and using security protocols and best practices. It is also important to avoid non-compliant use of data during the collection and processing stages.

There are also operational risks, such as the system's compatibility and stability. Be aware that web pages can be opened on all devices. ai chatbot also has to be aware of possible service interruptions. Additionally, there is a risk of low user acceptance, which necessitates meeting user expectations and iterating updates based on users feedbacks.

Personnel changes also lead to potential risks. The leaving of team members or stakeholders poses a risk that can disrupt the continuity of a project and cause delays. Implementing strong succession and timely documentation can help mitigate this risk.

# 5. Technical and other constraints

## 5.1 Technical Constraints

- WordPress Constraints:

    - Must use the Gutenberg editor; no third-party page builders allowed.
    - Greenshift block plugins, including dynamic fields and all premium features, should be utilized.
    - Recommended to start with the Greenshift FSE theme.
    - No custom code and no access to the underlying filesystem.
    - Only allowed plugins include: Advanced Custom Fields Pro, WPVivid Backup, WPVivid Merge, NEX-Forms, Rank Math, Any additional plugins require a security review.

- Security:
    - Adherence to ANU's security policies and procedures.
    - Regular updates and maintenance of the WordPress site to mitigate security risks.
    - Implementation of licensed plugins for enhanced security, reliability, and performance.
    - Chatbot Data Security: Ensure that all chatbot interactions are encrypted and comply with ANU's data protection policy.

- User Interface:
    - The website must be intuitive and easy to use, even for individuals with no web design background.
    - Drag-and-drop functionality provided by the Gutenberg editor to facilitate layout customization.
    - Ensuring the website is accessible and responsive across different devices and screen sizes.
    - Ensure that the chatbot is accessible and consistent with the design of the website.

- Maintenance:
    - Leveraging the Gutenberg editor and Greenshift plugins to simplify content management.
    - Regular backups and merge functionalities using WPVivid plugins.
    - No custom coding to ensure maintainability and ease of future updates.

## 5.2 Other Constraints

- Adherence to ANU Guidelines:
    - The website must comply with all relevant ANU guidelines and standards for web development and content management.
    - Ensure that the chatbot complies with all relevant privacy regulations and university policies.

- Client Requirements:

    - The website should cater to staff-oriented needs, ensuring ease of use for non-technical users.
    - Pros and cons of the existing CASS Education Design Studio website should be evaluated to inform improvements.

- Scalability:
    - The website should be designed with scalability in mind to accommodate potential future expansions and additional functionalities.

- Timeline:
    - Expected deadline for the website development is by the end of Semester 2, 2024.
    - Regular milestones and progress reviews should be scheduled to ensure timely delivery.

- Collaboration:
    - Continuous communication with the clients through meetings and updates.
    - Logging tickets in the IT service desk or contacting web.cbe@anu.edu.au for any support or issues.

- Educational Resources:
    - Team members should familiarize themselves with the provided video tutorials on building WordPress websites using the modern approach, especially focusing on the Full Site Editor and Greenshift functionalities.

- Performance and Scalability
    - The chatbot should also maintain a fast response time during peak usage hours, ideally under two seconds.
    - Ensure that the chatbot can scale seamlessly during peak usage hours and not impact performance or security.

By adhering to these technical and other constraints, the project can ensure a well-structured, maintainable, and user-friendly website that meets the needs of the clients and adheres to ANU's standards.

# 6. Stakeholder analysis

## 6.1 Client's Vision

The client envisions creating an interactive and user-friendly website to serve as a dynamic educational hub for teaching staff. The platform should feature a simple and intuitive interface, allowing users even without a technical background to easily use and maintain it. By integrating advanced features such as artificial intelligence chat bots, the website will be able to provide immediate responses and handle common inquiries.

This website will become a central hub for teaching-related information, including administrative matters, technical support, and practical guidance. It will offer important updates, resource searches, development opportunities, and contact information for support, enabling users to efficiently access the necessary content. Additionally, the website will provide a wealth of online resources such as videos, applications, and written materials, creating a robust educational environment for teaching staff.

In the future, the website will also collect and process user analytics data to further reduce tracking and reporting costs, continuously improve the website, and enhance the user experience. Through these goals, the client hopes that the project will not only provide a powerful and user-friendly educational platform but also enhance teaching and management efficiency through technological means, creating a better learning and working environment for both teaching staff and students.

## 6.2 Client's Objectives

- Develop an interactive and user-friendly website. Create a well-structured, informative and interactive website where teaching resources are presented in an attractive way. Ensure that the user interface is simple and intuitive, allowing users to find what they need quickly and efficiently.
- Integrate an AI chat bot. Implement an AI-powered chatbot that can handle inquiries about education policy and technology, providing instant response and support. The chatbot helps reduce the burden on manual IT support teams and increase responsiveness and efficiency.
- Ensure the platform is easy to manage. Design and develop the platform with users of different skill levels in mind, ensuring that its management and maintenance is simple and intuitive. Provide detailed user guides and training resources to help users master the use and maintenance skills of the platform. Develop a detailed maintenance and update plan to ensure the long-term sustainability and efficient operation of the website.

- Provide website security
- Strictly follow Australian National University (ANU) procedures and policies during the development process to ensure that the platform complies with the latest web technologies and security standards. Implement strict security measures including data encryption, firewall configuration and regular security updates. Develop and implement security policies to prevent unauthorized access and data leakage.
- Clarify intellectual property rights and maintenance responsibilities
- Clarify the ownership of intellectual property rights during the project to ensure that CBE can continue to maintain and update the website after the project is completed. Both parties discuss and define the ownership of intellectual property rights to ensure ownership and maintenance after the project is completed. Relevant agreements are signed to ensure legitimacy and transparency in the use and maintenance of the platform developed by the students.

## 6.3 Stakeholders Analysis

Categorizing stakeholders according to these attributes can help better understand each stakeholder's role and ensure effective communication and engagement throughout the project lifecycle. The main stakeholders are as follow:

- **Project Team (Students)**: As the executors of the project, our involvement is crucial. We have high influence, immediacy, vested interest and low power due to the direct role and the learning outcomes we expect to achieve.
- **Project Supervisor (Tutor)**: The role of tutor is to ensure the project aligns with educational goals and standards. The supervisor has high legitimacy, power and influence due to supervisory position, and they maintain medium immediacy through regular oversight and feedback.
- **CBE Education Portfolio (Client)**: Being the primary client, their requirements and feedback are critical. They have high power, influence and vested interest and medium immediacy as the end beneficiaries of the project.
- **Teaching Staff (End Users)**: As primary users, their feedback is essential for the project's success. They have some influence and vested interest in ensuring the platform meets their needs, though their power and immediacy are moderate compared to other stakeholders.
- **ANU Governance and IT Department**: They ensure the project complies with university policies and standards. Their power and influence are high, as they must approve the project, but their immediacy is moderate since they are not involved in day-to-day activities. Their vested interest is high due to their role in ensuring institutional compliance and data security.

## Table Stakeholder Analysis Matrix

| Stakeholder | Legitimacy | Power | Influence | Immediacy | Vested Interest |
|---|---|---|---|---|---|
| Project Team (Students) | High - Responsible for project execution | Low - Directly executing and developing the project | High - Direct impact on project outcomes | High - Directly involved in day-to-day project activities | High - Gain practical experience, academic success |
| Project Supervisor (Tutor) | High - Ensures educational objectives are met | High - Provides guidance and mark the grades | High - Influences project direction and ensures academic standards | Medium - Monitors progress and provides timely feedback | Medium - Ensure project aligns with curriculum standards |
| CBE Education Portfolio(Client) | High - Main client benefiting from the project | Low - Sets requirements and approves deliverables | High - Provides critical feedback and requirements | High - Needs timely updates and delivery | High - Obtain a functional, user-friendly educational platform |
| Teaching Staff (End Users) | High - Primary users of the platform | Low - Provide feedback and suggestions | High - User experience and feedback directly affect project success | Medium - Involved in user testing and feedback sessions | High - Improve access to resources and support for teaching |

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|---|---|---|---|---|---|
| ANU Governance and IT Department | High - Ensures compliance and security | High - Must approve the project for compliance and security | High - Their policies and standards shape the project requirements | Medium - Periodic reviews and approvals | High - Reduce the risk of non-compliance |

# 7. Signature

**Date: 4/8/2024**

**Client:** Henry Zhu

**Signature:**

**Date:**

**Client:** Dale Newbery

**Signature:**