



Oregon State
University

CS46x: Senior Software Engineering Project

A Web-Based Tool for Task-Delineated, AI-Assisted Assignments

Group 28:

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Introduction

This project is a website that acts as a more extensively featured Learning Management System, similar to Canvas.

Key Features:

- Task-delineation: Meaning divided tasks which enables complex structures for delivering assignments and tasks to students, allowing “stories.”
- AI-integration: Implements AI tools to help instructors develop class content and evaluate student performance, and help students use AI to improve their thought processes.



The Problem

Organization:

- Assignments are limited in their ability to represent complex structures in standard Learning Management Systems i.e. Canvas.

AI:

- Students are encouraged or incentivized to use AI tools to quickly finish assignments, which isn't productive for improving mental fitness
- Punishing AI use does not stamp out the root of the problem, and misses the opportunity to use the technology for our advantage.

The Solution

We propose that we can develop a tool that better organizes assignments and allows them to be represented more comprehensively.

We also believe that we can use AI to benefit students' learning and instructors to understand quickly how their students are doing.

More complex task organization and positive AI implementations will address the two issues in our problem statement.



Requirements

Our Project Mentor, Sanjai, has laid out the key requirements for this project, and we aim to complete them according to his guidance/desires.

Basic Overview:

- Prototype a tool which functions similarly to Canvas, with these features:
 - Organized assignment structures
 - AI helper bots for students
 - AI report generation for instructors



Requirements (cont)

The scope of our requirements are flexible in scope, and our project mentor emphasized that things will change. We have already removed an old “collaborative” requirement.

Example functional requirements:

- Configurable AI models
- Dividable assignment tasks/stories
- Exportable assignment objects
- Report Generation
- AI Bot Chat Window

Goals

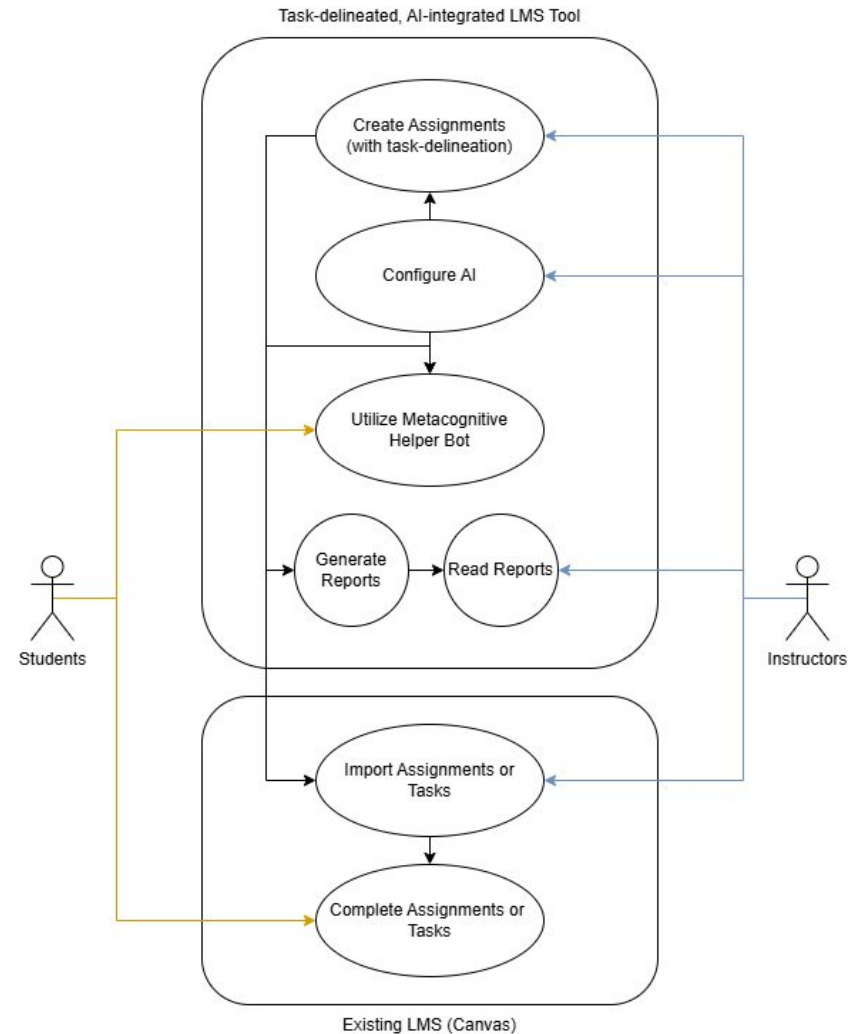
- Organizing assignments becomes easier for instructors, and students can more easily understand what is being assigned.
- AI can be used to help students learn and exercise their mind, rather than use AI as a crutch.
- AI helps instructors evaluate their students' strengths and weaknesses.

Example Goals/Metrics:

Goal	Signal	Metric
Improve task organization for instructors and students	Users can easily create and track assignments with clear task delineation	Survey professors on a likert scale that has 80% or more neutral-positive responses.
Facilitate efficient tracking of student progress for instructors	Instructors can easily monitor task completion and student progress across assignments	80% of instructors report on the survey that student progress tracking is easier or faster.

Use Cases

User	User Story	Criteria
University Instructor	As a university instructor, I want to designate when AI is appropriate and tailor chatbots to assist in those instances so that I can productively utilize AI in my classroom.	Instructors can enable or disable AI assistance for specific assignments or tasks within the tool.
Student	As a student, I want to be assisted through my learning journey, and receive help from an AI chatbot more productively, so that I can have a guided learning experience that improves my learning.	AI feedback and suggestions are actionable, allowing students to improve their work based on the guidance provided.





Design

The frontend and backend of this website will be built mostly traditionally, using HTML/CSS/JavaScript. For more complex web design, we also will use React/node.js.

For the scope of our project, we decided to use a pre-existing technology for our AI implementation. We will integrate this AI model with API requests for our AI features.



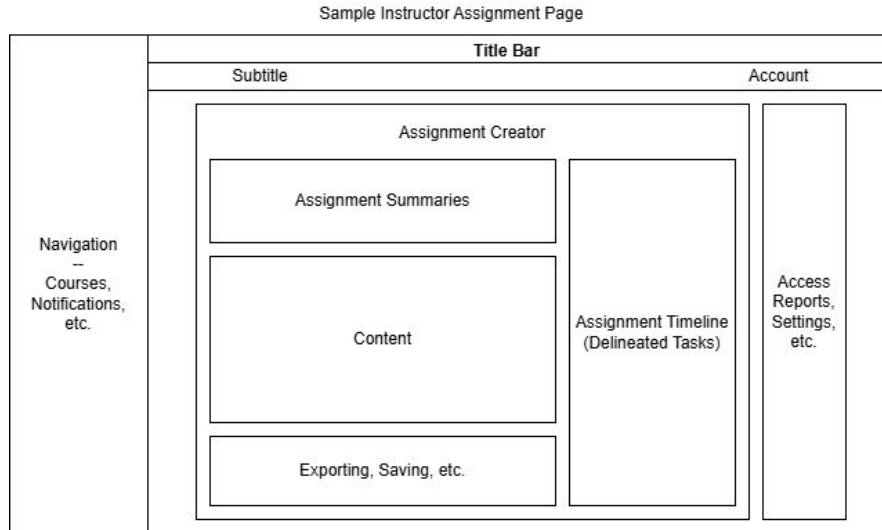
Components

Core Components:

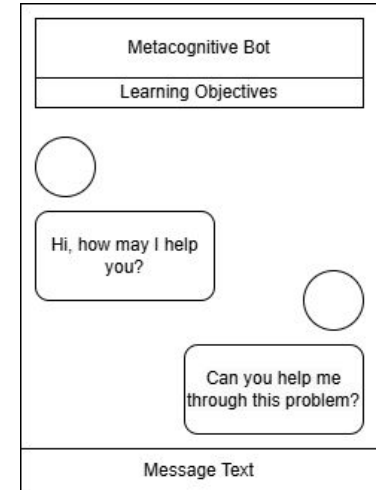
- Frontend
 - User Interface: Collects inputs and displays outputs
- Backend
 - Handles internal logic of the web-page
 - Includes part of API processing for AI components
- AI Components
 - Handles API requests with AI model

Mockups

Assignment Creation Page



AI Helper Bot





Accessibility

Inclusive and Accessible design is crucial for our project because education should be for everyone, and we need to accommodate for people with disabilities or ESL.

Considerations in our design process:

- Options for different reader stylings (i.e. font size, color)
- Adhering to language guidelines and using understandable language
- Basic language options for languages other than English



Mockups



Students Home Page

Dashboard

Today, November 20



WRITING IN BUSINESS (W_222_001_F2024) ASSIGNMENT
Essay 1

Sunday, November 24



SENIOR SOFTWARE ENGIN PROJECT(CS_461_001_F2024) ASSIGNMENT
Project Demo (Group Assignment)

Tuesday, November 26



INTEGRAL CALCULUS (M_262_001_F2024) ASSIGNMENT
Test 3



Students Assignment Page

Essay 1


1. Content Understanding
 - Clearly address the topic: How technology impacts society, including both positive and negative effects.
2. Organization and Structure
 - Include the following sections:
 - Introduction: Clearly state your thesis and provide context for the essay.
 - Body Paragraphs: Develop at least three well-organized paragraphs, each focusing on a specific aspect of the topic.
 - Conclusion: Summarize key points and provide a meaningful reflection or call to action.
3. Depth of Analysis
 - Go beyond surface-level observations. Discuss the implications of your arguments (e.g., how technological advancements affect societal behaviors, ethics, or future developments).
 - Address potential counterarguments or challenges to your claims.
4. Length and Formatting
 - The essay should be 500–750 words in length.
 - Use 12-point Times New Roman font, double-spaced, and 1-inch margins.
 - Include a title and a properly formatted heading.

MetaCognitive Helper Bot

Submit



Mockups (cont)


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Students Assignment Page


Meta Cognitive Helper Bot

Essay 1

Can you help me develop some ideas for my essay



Here are some general ideas for an essay:
1. Technology and Society
2. Environment and Sustainability
3. Education and Learning
4. Health and Wellness
5. Cultural and Social Issues
6. History and Politics
These ideas can be tailored based on the scope of the assignment and personal interest!

Type here 



Mockups (cont)





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Teacher "Essay 1" Submission Overview

"Essay 1" Submissions

Trent's Submission File Download: Class_Assignment.pdf Turned In: 11/11 @ 11:59 PM	Details
Ethan's Submission File Download: EthanLuAssignment.pdf Turned In: 11/11 @ 11:59 PM	Details
Oliver's Submission File Download: assignment5.pdf Turned In: 11/11 @ 11:59 PM	Details

AI Summary



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Teacher Assignment Submissions Page

Assignments










English 101, CRN: 159624

Essay 1 Post Date: 11/04 Due Date: 11/11 Total Submissions: 3/50	Essay 2 Post Date: Not Posted Due Date: Undecided Total Submissions: 0/50	Essay 3 Post Date: Not Posted Due Date: Undecided Total Submissions: 0/50
Essay 4 Post Date: Not Posted Due Date: Undecided Total Submissions: 0/50	Essay 5 Post Date: Not Posted Due Date: Undecided Total Submissions: 0/50	

Mockups (cont)



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Teacher Assignment Creation

Assignment Creation


Insert Assignment Content

Type here


Import Share Code

Type here

Export Share Code



Configurations



Create Assignment



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Demo

Reflection

Communication

We are still getting used to working together as a team in a more formal project setting. We address communication issues by setting up our team charter comprehensively.

Deciding on Design and Conflicting Ideas

We overcame disagreements by referring to our project mentor for guidance, and doing activities/research to come to better decisions.

Conclusion

Feedback

We will continue to focus on implementing our project alongside our project mentor to make sure his concerns are addressed.

Results

Our demo currently has the basic framework and navigation finished. The core functionality for the requirements which address our issue are not completed. Functionality of these features will develop gradually in winter.

Where do we go from here?

Continue to implement features which meet assignment organization and AI requirements – both functional and non-functional.



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Questions?



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Thank You!