

# LinguaTalk – AI-Powered English Conversation Tutor

*"Speak Naturally. Learn Smart."*

**Technical Report** — Deliverable #1

**Course** — Introduction to Software Engineering

**Instructor** — Dr. Amal Elgammal

**System Type** — AI-Powered English Learning Platform (LMS)

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# I. System Vision

## I.1 Overview

In today's interconnected world, English proficiency is vital for communication, education, and career success. Yet many learners struggle to achieve fluency due to limited practice opportunities, lack of conversational feedback, and unengaging digital resources.

**LinguaTalk** bridges this gap through an **AI-powered English learning platform** that integrates adaptive vocabulary training, real-time conversation practice, and instant pronunciation feedback. It simulates authentic dialogue with a virtual tutor that provides contextual correction and encouragement.

As an AI-powered English tutoring platform, LinguaTalk offers a dynamic *"Word of the Day"* curriculum that adapts to each learner's proficiency level, alongside topic-based conversations that build fluency and confidence naturally.

## I.2 Purpose

The purpose of LinguaTalk is to deliver an engaging, data-driven learning experience that enhances vocabulary, pronunciation, and conversational fluency through continuous AI interaction.

The system aims to overcome the limitations of static online lessons by providing personalized guidance, adaptive difficulty, real-time feedback, and casual conversation practice—helping learners overcome language barriers, achieve measurable progress, and ensure long-term retention.

## I.3 Scope

The project focuses on designing the foundational architecture of an intelligent online English tutoring system that includes:

- **Secure user registration and authentication** for personalized profiles.
- **Adaptive "Word of the Day" vocabulary system** based on proficiency level.
- **Real-time AI conversation practice** with pronunciation and usage feedback.
- **Progress dashboard and analytics** showing performance and learning history.
- **Centralized database management** for users, words, and learning levels.

## I.4 Goals

- ★ Expand learners' vocabulary through structured, level-based learning.
- ★ Improve pronunciation accuracy and contextual word use.
- ★ Build speaking confidence through AI-assisted dialogue.
- ★ Deliver a user-friendly, accessible platform across devices.

## I.5 Value and Benefits

**For learners**, LinguaTalk provides a self-paced, personalized environment that mirrors authentic English conversation while offering instant feedback to strengthen fluency and build confidence.

By blending adaptive curriculum design with conversational AI, **LinguaTalk** ensures engagement, measurable improvement, and genuine language mastery, redefining how digital English learning is achieved.

## 2. Stakeholder Identification

Category	Example Stakeholder	Aspects of the System of Particular Interest
<b>Internal Operational Stakeholders</b>	<ul style="list-style-type: none"> <li>• Developers and testers</li> <li>• System/database administrator</li> <li>• Customer support team</li> </ul>	<ul style="list-style-type: none"> <li>• Daily system operation and maintenance</li> <li>• Database performance and security</li> <li>• Resolving user-reported issues efficiently</li> </ul>
<b>Internal Executive Stakeholders</b>	<ul style="list-style-type: none"> <li>• Project manager / product owner</li> <li>• Product design supervisor / project supervisor</li> <li>• Project mentor / quality reviewer</li> </ul>	<ul style="list-style-type: none"> <li>• Project progress, scope, and budget control</li> <li>• Learner performance analytics and engagement metrics</li> <li>• Strategic alignment with project goals</li> </ul>
<b>External Operational Stakeholders</b>	<ul style="list-style-type: none"> <li>• Learners using LinguaTalk</li> <li>• AI speech engine provider</li> </ul>	<ul style="list-style-type: none"> <li>• Personalized learning experience and adaptive vocabulary system</li> <li>• Accurate pronunciation feedback and natural conversation responses</li> <li>• Data privacy and consistent system availability</li> </ul>
<b>External Executive Stakeholders</b>	<ul style="list-style-type: none"> <li>• Investors / sponsors</li> <li>• Third-party language experts / content reviewers</li> <li>• Individual learners seeking structured, high-quality English learning experiences</li> </ul>	<ul style="list-style-type: none"> <li>• Return on investment and cost efficiency</li> <li>• Learner satisfaction, progress, and long-term engagement</li> <li>• Platform scalability, innovation, and market growth opportunities</li> </ul>

### 3. Functional Requirements

1. **User Registration and Authentication** – The system allows learners to register and log in securely, creating unique learner profiles for personalized progress tracking.
2. **User Data Management** – The system stores and manages user information, including name, proficiency level, vocabulary history, and learning progress.
3. **Adaptive “Word of the Day” Feature** – The system delivers a daily word dynamically adapted to each learner’s proficiency level.
4. **AI Conversation Sessions** –The system lets users choose conversation topics and engage in real-time English dialogues with a native-level AI tutor that responds naturally and contextually, helping learners practice speaking and build confidence through interactive conversation.
5. **Prompt Development** – The AI tutor’s personality, tone, and teaching behavior are crafted through carefully written prompts by the development team. These prompts guide how the AI interacts with learners, responds to questions, and adapts to different levels of proficiency. By refining and updating these prompts, the developers continuously improve the learning experience, ensuring consistency, clarity, and a natural conversational flow across all lessons.
6. **Pronunciation Analysis and Feedback** – The system analyzes user pronunciation and provides instant corrective feedback.
7. **Vocabulary Tracking** – The system records learned vocabulary and marks mastered words as completed in the learner’s history.
8. **Progress Reporting** – The system generates and displays progress summaries covering vocabulary growth, pronunciation accuracy, and total learning time.
9. **Administrator Dashboard** – The backend system provides a centralized dashboard for system administrators to monitor every learner’s performance, manage user data in real time.
10. **Centralized Data Storage** – The system stores all learning activity data in a secure, centralized database for reporting and analytics.

- 11. User Dashboard** – The system provides an intuitive dashboard displaying learned words, pronunciation results, and session statistics.
- 12. Administrator Dashboard** – The backend system provides a centralized dashboard for system administrators to monitor every learner's performance and manage user data in real time. It also allows administrators to edit and control core learning elements such as vocabulary lists, AI prompts, and lesson topics
- 13. Integration with External AI APIs** – The system connects to ChatGPT real-time AI model to deliver interactive tutoring sessions, enabling natural conversations, dynamic question handling, and personalized learning experiences based on the system's defined prompts.
- 14. Secure Online Payments** – The system supports secure online payments for premium or subscription-based features.
- 15. Multi-Device Accessibility** – The system ensures learners can access LinguaTalk seamlessly on web and mobile platforms.

## 4. Requirements Elicitation Techniques

### 4.1 Interviews

**Purpose:** To collect in-depth qualitative feedback from learners, instructors, and project supervisors.

**Description:** Interviews will provide insights into how users currently learn English, the challenges they face in achieving speaking fluency, and which features (e.g., pronunciation feedback, adaptive vocabulary) motivate continuous practice. Discussions with instructors and supervisors will help identify key performance metrics, instructional goals, and content management needs that guide system functionality.

### 4.2 Questionnaires

**Purpose:** To gather large-scale, structured data from potential learners regarding preferences and expectations.

**Description:** Online questionnaires will be distributed to language learners to capture usage patterns, preferred learning frequencies, feature interest (e.g., AI tutor conversations, Word of the Day), and device accessibility. The collected data will help prioritize highly requested features and refine the platform's user experience and content delivery model.

### 4.3 Observation

**Purpose:** To study how learners currently engage with existing language-learning tools or speaking applications.

**Description:** Observing real learners during practice sessions will reveal usability issues—such as difficulty navigating interfaces, unclear feedback mechanisms, or speech recognition problems. These insights will support intuitive UI/UX design and ensure LinguaTalk is culturally and linguistically suitable for non-native English speakers.

### 4.4 Prototype Testing

**Purpose:** To verify that all system workflows and core functionalities operate as intended before full-scale implementation.

**Description:** Prototype testing focuses on ensuring that database operations, interactive features, and AI-driven components function correctly and maintain data integrity throughout the process. This stage confirms that key actions—such as user interactions, progress tracking, and system responses—are executed and stored reliably prior to final development.

### 4.5 Usability Testing

**Purpose:** To evaluate how efficiently and comfortably users can navigate the system and achieve their learning goals.

**Description:** Conducting usability sessions with learners will help identify confusing interactions, unclear instructions, or slow response times. This feedback will drive improvements in accessibility, layout, and conversational flow. Ensuring a smooth, confidence-building experience across web and mobile platforms.

## 5. Interview Agendas

### Interview I: Internal Operational Stakeholder

**Stakeholder Role:** System Developer / Technical Team Member

**Purpose:** To understand the technical and functional requirements from a system development and maintenance perspective.

1. **What are the main features that must be included in the first version of LinguaTalk?**  
→ *Helps identify development priorities for the initial system release.*
2. **Which programming tools, frameworks, or AI services do you recommend for building the system's conversation and pronunciation features?**  
→ *Determines suitable technologies for reliable and natural AI interactions.*
3. **What technical challenges might arise when implementing real-time conversational interaction and feedback using AI models?**  
→ *Helps the team plan for potential challenges early in development.*
4. **How should learner data (profiles, vocabulary progress, and conversation history) be organized and stored securely?**  
→ *Ensures the system handles data safely and efficiently.*
5. **What steps can we take to make sure the system runs smoothly on both computers and mobile devices?**  
→ *Supports consistent performance and accessibility across platforms.*
6. **What type of information should be recorded to help monitor system health and fix technical issues?**  
→ *Identifies logging and monitoring needs for maintenance and improvement.*
7. **How can the development team balance fast progress with maintaining high accuracy in AI-generated conversations?**  
→ *Encourages planning for both speed and quality in system development.*
8. **What administrative tools or permissions should developers include for updating vocabulary lists, AI prompts, or lesson content?**  
→ *Defines necessary backend and content management capabilities.*
9. **How can the technical team collaborate effectively with language experts to ensure learning content is accurate and engaging?**  
→ *Promotes teamwork between developers and educational specialists.*

## Interview 2: Internal Executive Stakeholder

**Stakeholder Role:** Project Manager / Product Owner

**Purpose:** To identify strategic objectives, success criteria, and management expectations for the design, implementation, and growth of the LinguaTalk platform.

1. **What inspired the idea of LinguaTalk, and what key problems do you expect it to solve for English learners?**  
→ *Shows understanding of project motivation and vision.*
2. **What are the main success indicators you will use to evaluate the system's performance (e.g., learner progress, usage rates, satisfaction levels)?**  
→ *Focuses on measurable results.*
3. **Which system features are most critical for the first launch, and which can be added later in future updates?**  
→ *Helps prioritize project phases.*
4. **How should LinguaTalk align with the project's learning objectives and long-term user engagement strategy?**  
→ *Connects project objectives to user-focused learning outcomes.*
5. **What challenges or risks do you foresee during the system's development or deployment?**  
→ *Shows planning awareness and risk management.*
6. **What reporting tools or analytics do you expect to see on the administrative dashboard?**  
→ *Clarifies management-level data requirements.*
7. **How can we ensure the platform remains sustainable and scalable as more learners join?**  
→ *Addresses long-term system performance and resource planning.*
8. **How do you expect LinguaTalk to enhance your institution's reputation or value to learners?**  
→ *Explores strategic impact and value proposition.*



## 6. Questionnaire

### Section A: General Information

1. Age group:  
☐ Under 15    ☐ 15–20    ☐ 21–30    ☐ Above 30
2. Current English proficiency level:  
☐ Beginner    ☐ Intermediate    ☐ Advanced
3. How often do you practice speaking English each week?  
☐ Rarely    ☐ 1–2 times    ☐ 3–4 times    ☐ Daily
4. How often are you exposed to English in your daily life (e.g., podcasts, videos, or social media)?  
☐ Rarely    ☐ Occasionally    ☐ Frequently    ☐ Daily

### Section B: Learning Preferences

4. What motivates you most to improve your English?  
☐ Academic goals    ☐ Career advancement    ☐ Travel    ☐ Personal interest
5. Which language skills do you want to focus on most?  
☐ Speaking    ☐ Pronunciation    ☐ Vocabulary    ☐ Listening
6. How do you prefer to learn new vocabulary?  
☐ Through games or quizzes    ☐ Daily words    ☐ Conversation practice    ☐ Reading exercises

### Section C: System Features

7. How useful do you think an AI tutor that speaks like a native English speaker would be for your learning?  
☐ Not useful    ☐ Somewhat useful    ☐ Useful    ☐ Very useful
8. Rate the importance of the following LinguaTalk features (1 = Not important, 5 = Very important):  

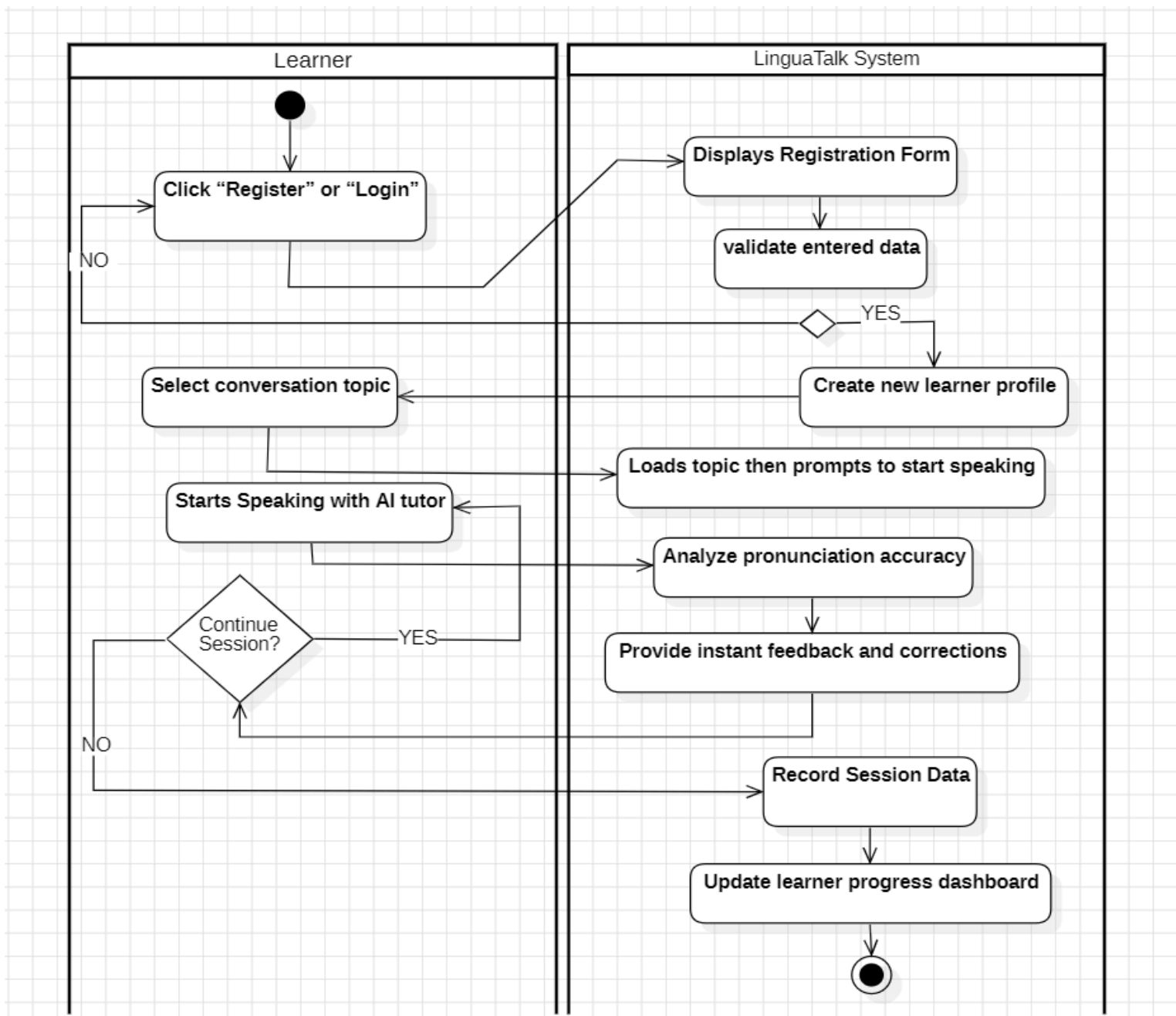
→ Adaptive “Word of the Day” feature	1	2	3	4	5
→ Real-time conversation with AI	1	2	3	4	5
→ Pronunciation feedback	1	2	3	4	5
→ Progress tracking dashboard	1	2	3	4	5
9. What device would you most likely use for LinguaTalk?  
☐ Smartphone    ☐ Tablet    ☐ Laptop    ☐ Desktop Computer

### Section D: User Experience and Expectations

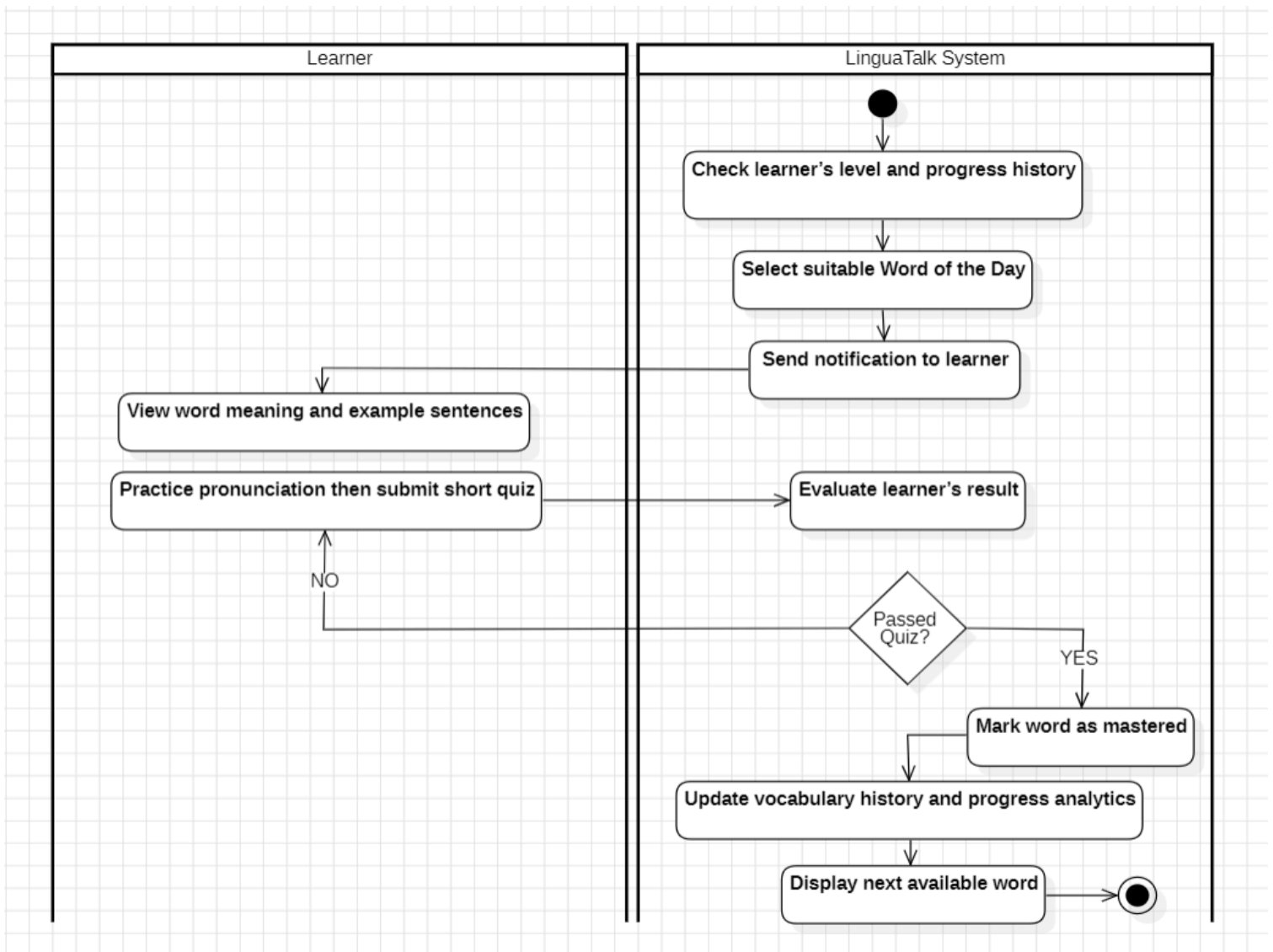
10. What difficulties do you usually face when using online English-learning platforms?  
(Open-ended) \_\_\_\_\_
11. What features or tools would make an English-learning platform more fun and motivating for you?  
(Open-ended) \_\_\_\_\_
12. Would you be willing to use LinguaTalk regularly if it provides personalized feedback and natural conversation practice?  
☐ Yes    ☐ Maybe    ☐ No

## 7. Workflow Documentation

### Business Process I – AI Conversation Practice Workflow (Activity Diagram):



## Business Process 2 – Word of the Day Adaptive Learning Workflow (Activity Diagram):



## 8. Jira for Project Management

To ensure clear organization and time management during the development of Deliverable I, our team relied on Jira Project Management as the main coordination tool.

### Purpose of Using Jira

- To manage and monitor project activities efficiently.
- To divide work equally among team members based on strengths.
- To track progress and ensure all tasks were completed before the deadline.

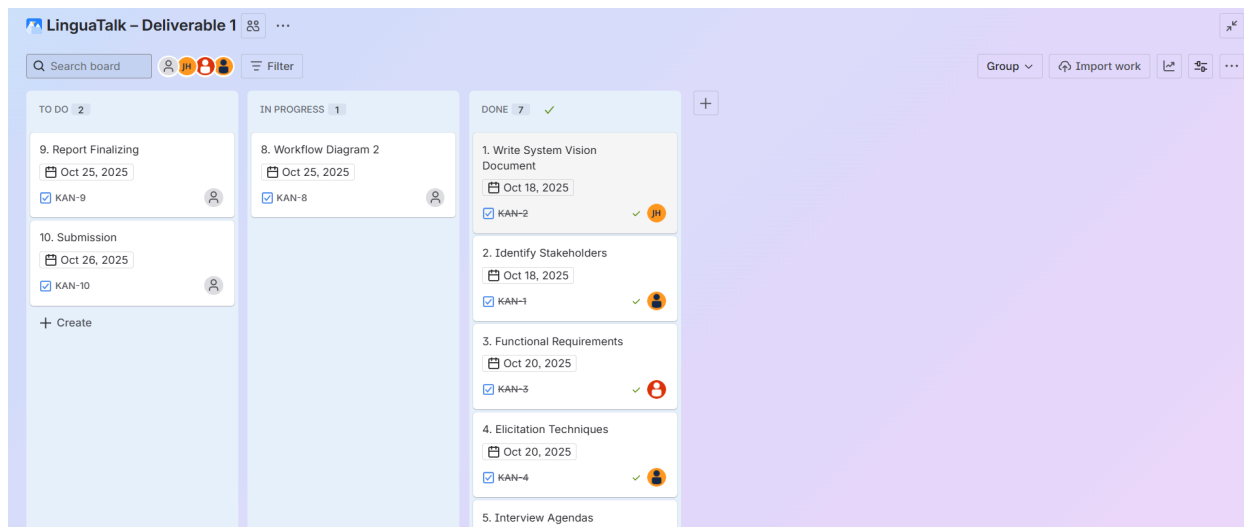
### How We Used Jira

1. Created a project titled “LinguaTalk – Deliverable I” using the Project Management template.
2. Added all required deliverable tasks (System Vision, Stakeholders, Requirements, Diagrams, etc.).
3. Assigned each task to a specific team member with start and due dates.
4. Updated task statuses regularly (*To Do*, *In Progress*, *Done*) to reflect progress.
5. Used the Timeline and List views to visualize dependencies and overall completion.

### Benefits Achieved

- Improved coordination and equal workload distribution.
- Clear visibility of deadlines and project flow.
- Faster communication and easier tracking of completed tasks.
- Ensured that all report sections and diagrams were finished and reviewed on time.

Jira allowed the team to stay organized, focused, and fully aligned with the project management practices.



## 9. Github for collaborative Work

**Respiratory Link:** <https://github.com/jjanamohamed/LinguaTalk-Project.git>