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**TOBB ETU**

**Economy & Technology University**

**BIL 481**

**Project Management Plan (PMP)**

**Reference:** IEEE 1058 / ISO/IEC 12207

## **Lexora - AI-Powered Language Learning Dictionary** **Assignment:** Project Assignment 1 **Due Date:** November 7, 2025

**Team Members:**

* Gülsüm Yıldırım (221404031)
* Nurefşan Olfaz (211301008)
* Ozan Bayer (211201024)

## 

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## **1. PROJECT SCOPE**

The project plan covers the design, development, testing, and deployment of a single-user web application that uses AI to assist vocabulary learning. The planned development activities include building a responsive HTML-based interface, integrating AI models for word definition and example generation, creating a local JSON-based database for storing searched words, and implementing additional tools such as a streak tracker, podcast generator, and PDF export feature.

The project will focus on the core functional features and user experience improvements within the defined timeline. It does not include large-scale extensions such as multi-user functionality, mobile app versions, or cloud-based systems.

**Included in Project Plan:**

* Designing and coding the web interface
* Integrating AI-based features for text processing and generation
* Implementing a JSON-based local database
* Adding streak tracking and podcast generation functionality
* Ensuring responsiveness across desktop and mobile browsers
* Testing and documentation

**Excluded from Project Plan:**

* Multi-user architecture or authentication modules
* Mobile app development
* Cloud or external server deployment

## **2. PROJECT ORGANIZATION - PEOPLE**

### **2.1 Team Structure**

***Project Manager (Rotating Role)***

* **Responsibility:** Overall project coordination, timeline monitoring, stakeholder communication
* **Assigned To:** Rotating among all team members
* **Key Tasks:** Schedule meetings, track progress, resolve conflicts, ensure deliverable completion

***Frontend Developer & UI/UX Designer***

* **Assigned To:** Gülsüm Yıldırım
* **Responsibilities:**
  + Design user interface and user experience
  + Implement frontend components using React.js or Vue.js
  + Ensure responsive design across devices
  + Create flashcard interface and dashboard visualizations
  + Develop word library and group management interfaces
  + Conduct usability testing and gather feedback

***Backend Developer & Database Administrator***

* **Assigned To:** Nurefşan Olfaz
* **Responsibilities:**
  + Design system architecture and database schema
  + Develop RESTful API endpoints
  + Implement user authentication and authorization
  + Manage database operations and data persistence
  + Configure deployment environment
  + Handle server-side security measures
  + Write technical documentation

***AI Integration Specialist & Feature Developer***

* **Assigned To:** Ozan Bayer
* **Responsibilities:**
  + Research and integrate AI APIs for content generation
  + Implement podcast generation with text-to-speech
  + Develop streak tracking and analytics features
  + Coordinate integration testing across components
  + Optimize API usage and implement caching
  + Handle error management for external services
  + Create API documentation

### **2.2 Roles and Responsibilities Matrix**

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Team Member** | **Key Deliverables** | **Time Commitment** |
| Project Manager | All members | Meeting notes, progress reports, timeline updates | 3-4 hours/week |
| Frontend Developer | Gülsüm Yıldırım | UI components, responsive design, user documentation | 12-15 hours/week |
| Backend Developer | Nurefşan Olfaz | API endpoints, database, authentication, deployment | 13-16 hours/week |
| AI/ML Specialist | Ozan Bayer | AI integration, podcast feature, analytics, testing | 12-15 hours/week |
| Quality Assurance | All members | Test cases, bug reports, code reviews | 2-3 hours/week |
| Documentation | All members | Technical docs, user manual, project reports | 2-4 hours/week |

### **2.3 Decision-Making Authority**

All major technical decisions will be made through consensus among all team members; if consensus cannot be reached, the decision will be determined by majority vote. Any proposed change to the project scope will require unanimous approval from all team members before implementation. In the case of task reassignment, the affected member may propose the change, which must then be approved by the project manager, a role that rotates among members. Tool selection will be handled by the responsible leads in each area: the Frontend Lead will decide on frontend tools, the Backend Lead on backend tools, and the AI Specialist on AI/ML tools. If any conflict arises that cannot be resolved internally, it will be escalated to the course instructor for final arbitration.

## **3. OBJECTIVES**

### **3.1 Project Execution Objectives**

***Technical Excellence:***

* Implement one core functionality of the system (e.g., AI-powered word definition generation) as a working prototype.
* Successfully integrate at least one external API (AI or text-to-speech).
* Ensure the web interface functions smoothly on both desktop and mobile browsers.
* Maintain a clean and modular codebase suitable for future extension.

***Project Management:***

* Complete the implementation within the 12-week course timeline.
* Keep total external API costs under $50.
* Maintain balanced workload distribution among team members.
* Conduct weekly progress check-ins and ensure timely documentation submission.

***Learning and Skill Development:***

* Gain hands-on experience with web development fundamentals (HTML, CSS, JS).
* Learn how to integrate and use AI APIs effectively.
* Apply basic version control and collaboration practices on GitHub.
* Improve skills in project planning and requirement specification.

***Quality and User Experience:***

* Deliver a simple and intuitive interface demonstrating the selected feature.
* Ensure the prototype meets all defined functional and non-functional requirements for that feature.
* Collect feedback from test users and make minor usability improvements.

### **3.2 Success Metrics for Project Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **Objective Category** | **Metric** | **Target** | **Measurement Method** |
| **Feature Completion** | Core function implemented | 1 fully working feature | Demonstration testing |
| **Timeline Adherence** | Work completed on schedule | 90% of milestones met | Weekly progress review |
| **Workload Balance** | Effort distribution | Balanced across members | GitHub contribution analysis |
| **Budget Control** | API usage cost | ≤ $50 | Usage tracking |
| **Documentation** | Timely submission | 100% on-time | Submission records |

## **4. KEY PHASES AND TIMELINE**

### **4.1 Project Timeline Overview**

**Project Duration:** 5 weeks  
**Start Date:** October 27, 2025  
**End Date:** December 3, 2025

### **4.2 Detailed Phase Breakdown**

Phase Timeline (5 weeks total):

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Dates** | **Phase** | **Main Tasks & Deliverables** |
| **Week 1** | Oct 27 – Nov 2 | **Planning & Setup** | project scope finalization, tool selection (frontend/backend/AI), role distribution, GitHub repository setup |
| **Week 2** | Nov 3 – Nov 9 | **Design Phase** | system architecture outline, database schema draft, API planning, basic UI wireframe |
| **Week 3** | Nov 10 – Nov 16 | **Core Development** | implementation of the selected core feature (backend endpoints, frontend integration), initial testing |
| **Week 4** | Nov 17 – Nov 23 | **Integration & Testing** | full workflow testing for the implemented feature, debugging, minor improvements |
| **Week 5** | Nov 24 – Dec 3 | **Finalization & Reporting** | final testing and optimization, documentation (user guide + technical notes), presentation preparation and submission |

### **4.3 Gantt Chart (Visual Representation)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Phase** | **Oct 27 – Nov 2** | **Nov 3 – Nov 9** | **Nov 10 – Nov 16** | **Nov 17 – Nov 23** | **Nov 24 – Dec 3** |
| **Planning & Setup** | ████████ |  |  |  |  |
| **Design Phase** |  | ████████ |  |  |  |
| **Core Development** |  |  | ████████ |  |  |
| **Integration & Testing** |  |  |  | ████████ |  |
| **Finalization & Reporting** |  |  |  |  | ████████ |

### **4.4 Key Milestones and Deliverables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Milestone** | **Deliverable** | **Target Date** | **Responsible** |
| **M1: Project Kickoff** | Project definition, scope, and requirement documentation completed | **Nov 2, 2025** | All team |
| **M2: Design Complete** | System architecture, UI mockups, and database schema finalized | **Nov 9, 2025** | Gülsüm & Nurefşan |
| **M3: Core Development Ready** | Basic backend setup, database connected, and core API functional | **Nov 15, 2025** | Nurefşan |
| **M4: AI Functionality Working** | Word definition and example generation via AI operational | **Nov 17, 2025** | Ozan |
| **M5: Frontend Integration Complete** | User interface connected with backend and AI module | **Nov 22, 2025** | Gülsüm & Nurefşan |
| **M6: Testing & Debugging Complete** | System testing finished, major bugs resolved | **Nov 29, 2025** | All team |
| **M7: Documentation & Final Delivery** | Final report, demo preparation, and deployment completed | **Dec 3, 2025** | All team |
| **M8: Project Closure & Evaluation** | Final presentation and instructor evaluation | **Dec ?, 2025** | All team |

### **4.5 Critical Path**

The critical path for this project follows this sequence:

Requirements Gathering → Design → Core Development → AI Integration → Frontend Integration → Testing & Debugging → Final Delivery

## **5. RESOURCE PLANNING**

The project will be developed by a team of three student developers using personal laptops and freely available online tools. Each member will contribute approximately 4 hours per week over 5 weeks, totaling around 75 team hours.

### **5.1 Software and Tools**

* **Development:** Visual Studio Code, Git, GitHub
* **Frontend:** HTML, CSS, JavaScript (React optional)
* **Backend:** Node.js (Express) or Python (Flask)
* **Database:** Local JSON storage (no SQL server needed)
* **AI Integration:** OpenAI or Gemini API for word definition and example generation
* **Text-to-Speech (TTS):** Google Cloud or Amazon Polly
* **Testing & Deployment:** Postman, free hosting on Vercel or Heroku

### **5.2 Hardware**

* Each team member’s personal laptop
* Mobile and desktop browsers for responsive testing

### **5.3 Learning Resources**

* AI/ML model usage guides
* Online tutorials on prompt engineering and AI integration
* Course materials from BIL481

## **6. RISK MANAGEMENT**

During the project, several risks may affect progress. The team will monitor these regularly and take preventive measures when needed.

* **API Cost Overruns:** AI or TTS APIs may exceed the free usage limit.  
   *Mitigation:* Use caching, rate limiting, and monitor API usage weekly.
* **Technical Difficulties:** AI or TTS integration may require extra time or troubleshooting.  
   *Mitigation:* Start integration early, allocate buffer time, and use simplified fallback solutions.
* **Team Member Unavailability:** Academic workload may limit member availability.  
   *Mitigation:* Share documentation clearly, cross-train members, and redistribute tasks as needed.
* **Integration Issues:** Frontend, backend, and AI modules may not connect smoothly.  
   *Mitigation:* Conduct early integration testing and maintain consistent JSON data formats.
* **Scope Creep:** Adding new features beyond the plan may delay completion.  
   *Mitigation:* Follow the defined scope and review any proposed changes in weekly meetings.

The team will briefly review risks in every weekly meeting and consult the instructor if any issue threatens the timeline or deliverables.

## 

## **7. COMMUNICATION PLAN**

Communication among team members will be maintained through weekly online meetings and daily coordination via messaging tools.

* **Weekly Meetings:**The team will meet every Friday at 7:00 PM via Zoom Meeting to review progress, discuss challenges, and plan next steps.
* **Daily Communication:**Quick updates and coordination will occur through a WhatsApp group for urgent matters.
* **Collaboration Tools:**
  + **GitHub:** for version control, code sharing, and issue tracking
  + **Google Drive:** for documentation and shared resources
* **Instructor Communication:**The course instructor will be contacted via email or during weekly check-ins if guidance or approval is required.
* **Conflict Resolution:**Any disagreements will first be discussed in team meetings; unresolved issues will be escalated to the instructor.

## **8. CHANGE MANAGEMENT PLAN**

To keep the project organized and on schedule, any changes to the project scope or requirements will follow a simple review process.

* **Definition of Change:**Any modification to approved requirements, features, or technologies that could affect scope, timeline, or workload.
* **Submission:**Any team member can propose a change by informing others through Whatsapp or GitHub issue board.
* **Review Process:**The team will discuss proposed changes during the weekly meeting.  
  Each change will be evaluated based on:  
  + Impact on project scope and timeline
  + Technical feasibility
  + Alignment with project objectives
* **Decision Making:**
  + **Minor changes** (e.g., text edits, styling fixes): approved by the responsible developer.
  + **Moderate or major changes** (e.g., feature updates, API modifications): require team agreement.
  + **Critical changes** affecting core architecture or schedule: discussed with the instructor.
* **Documentation:**Approved changes will be recorded in the project’s GitHub issue tracker and mentioned in weekly meeting notes.
* **Scope Control:**After **Week 4 (November 24, 2025)**, no new features will be added; only bug fixes and small adjustments will be allowed.

## **9. BUDGET PLAN**

The project requires no major financial expenses other than limited API usage. All development tools and hosting resources are free. The main investment is the team’s total effort of approximately 75 hours throughout the 5-week period.

**Effort Allocation by Phase:**

|  |  |  |
| --- | --- | --- |
| **Phase** | **Description** | **Team Effort** |
| Week 1 | Requirements and planning | All members (~10 hours total) |
| Week 2 | Design and setup | Gülsüm & Nurefşan (~15 hours) |
| Weeks 3–4 | Core development (frontend, backend, AI integration) | All members (~35 hours total) |
| Week 5 | Testing, documentation, and final delivery | All members (~15 hours total) |

**Software and Hardware Resources:**

* **Frontend:** HTML (Free)
* **Backend:** Python (Free)
* **Database:** JSON files (Free)
* **AI API:** OpenAI GPT-4o mini (~$20–$50 for development and testing)
* **Text-to-Speech:** OpenAI API (included above)
* **Development Tools:** VS Code, GitHub (Free)
* **Hosting:** Local or free-tier deployment
* **Hardware:** Personal computers and internet (already available)

**Monitoring:**Effort and progress will be tracked weekly through GitHub commits and task reviews. API usage will be monitored to stay within the $50 limit.

## **10. DOCUMENT-SPECIFIC TASK MATRIX**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task Description** | **Responsible Team Member** | **Status** | **Completion Date** |
| Project name and summary definition | All team members | Completed | Oct 27, 2025 |
| Objectives and scope definition | Nurefşan Olfaz & Gülsüm Yıldırım | Completed | Oct 27, 2025 |
| Target audience analysis | Ozan Bayer | Completed | Oct 29, 2025 |
| Key features specification | All team members | Completed | Oct 28, 2025 |
| Deliverables list creation | Ozan Bayer | Completed | Oct 31, 2025 |
| Effort and budget planning (75 hours total) | Nurefşan Olfaz | Completed | Nov 1, 2025 |
| Risk analysis and mitigation strategies | Ozan Bayer | Completed | Nov 3, 2025 |
| Success criteria definition | Gülsüm Yıldırım | Completed | Nov 1, 2025 |
| Document formatting and review | All team members | Completed | Nov 3, 2025 |
| Final proofreading and submission preparation | All team members | Completed | Nov 3, 2025 |

## **11. REFERENCES**

The following sources and materials were referenced during the preparation of this Project Overview document:

* Sommerville, I. (2016). Software Engineering – for project planning and software engineering best practices
* PMBOK Guide (7th ed.) – for project management methodologies and stakeholder analysis
* OpenAI API Documentation – for AI-based content generation capabilities
* Google Gemini API Documentation – for alternative AI-based content generation
* Google Cloud Text-to-Speech API – for podcast audio generation features

BIL 481 course project templates and guidelines provided by instructors

**Prepared by:** Gülsüm Yıldırım, Nurefşan Olfaz, Ozan Bayer