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Contents

[Introduction 3](#_Toc184245469)

[Document Purpose 3](#_Toc184245470)

[Technologies 4](#_Toc184245471)

[Python 4](#_Toc184245472)

[Rasa 4](#_Toc184245473)

[PostgreSQL 4](#_Toc184245474)

[Django 4](#_Toc184245475)

[Git 4](#_Toc184245476)

[Postman 4](#_Toc184245477)

# 1. Introduction

## **1.1 Purpose**

This document outlines LingoLizard’s internal structure, including its core components, website functionality, and final product objectives. It provides a detailed breakdown of the technologies used and their planned implementation, along with an overview of the alpha release for the first iteration.

## **1.2 Scope**

LingoLizard is an AI-driven chatbot designed for real-time language learning through interactive conversations. It combines natural language understanding (NLU), grammar correction, and role-based scenarios to create an immersive educational experience.

## 1.3 Objectives

* Improve users' spelling and grammar through real-time correction.
* Provide interactive role-playing scenarios to simulate real-world conversations.
* Offer AI-powered feedback to enhance learning and retention.
* Enable multi-language support for diverse learners.
* Foster confidence in communication through continuous practice and feedback.

## 1.4 Stakeholders

* **Language Learners** – Individuals looking to improve their proficiency in a foreign language.
* **Educators** – Teachers seeking an interactive tool to assist students with language acquisition.
* **Developers** – Engineers and researchers working on AI-driven language learning solutions.
* **Language Enthusiasts** – Users who enjoy practising new languages in a structured yet engaging way.

## 1.5 Definitions and Acronyms

* **NLP (Natural Language Processing):** AI-driven technology used to process and analyse language input.

# 2. System Overview

## 2.1 High-Level Architecture

LingoLizard is an AI-driven language learning chatbot that provides users with real-time conversational practice. The system is built using Microsoft Bot Framework and integrates natural language processing (NLP) for feedback, grammar correction, and translation. The architecture consists of:

* A **dialog management system** to guide users through language scenarios.
* A **user state manager** to track progress and preferences.
* **AI-powered NLP tools** for grammar correction and sentiment analysis.
* A **cloud-based backend** for conversation processing and storage.

## 2.2 Key Features

* **Real-Time Conversational Learning** – Users engage in simulated dialogues in various real-world scenarios.
* **AI-Powered Feedback** – Instant corrections for spelling, grammar, and pronunciation.
* **Scenario-Based Practice** – Role-play interactions such as booking a taxi, checking into a hotel, or attending a job interview.
* **Multi-Language Support** – Users can select different languages and proficiency levels.
* **User State Tracking** – Saves language preferences and learning progress.

## 2.3 Supported Languages and Scenarios

LingoLizard supports multiple languages, allowing users to practice real-life conversations.

**Available Languages:**

* Spanish
* French
* Portuguese
* (Future expansion to other languages)

**Available Scenarios:**

* **Taxi Scenario:** Practising how to request a ride and give directions.
* **Hotel Scenario:** Booking a room and handling customer service interactions.
* **Job Interview Scenario:** Answering common interview questions in a foreign language.
* **AI (Artificial Intelligence):** Machine learning models powering grammar correction and conversation flow.
* **Bot Framework:** Microsoft’s platform for building conversational AI chatbots.
* **Proficiency Levels:** Categories of language skill (Beginner, Intermediate, Advanced).

# Document Purpose

This document will outline LingoLizard's internal structure. It will describe the internal components and website and how they will function as a final product.

I will include a list of technologies I am using and how they are planned to be used, along with details of the alpha released for the first iteration.

# Technologies

## Python

A general-purpose programming language. Python is the foundation of LingoLizard, for backend logic, Rasa integration and database interaction.

## Microsoft Bot Builder

An open-source framework for building AI-powered conversational chatbots. Rasa does the natural language understanding (NLU) and dialogue management in LingoLizard, so language learners get real-time grammar correction and conversational practice.

## PostgreSQL

A powerful open-source relational database system. PostgreSQL is used to store and manage structured data in LingoLizard, like user profiles, progress and scenario configurations.

## Git

A distributed version control system that tracks changes in the code during development. Git is used to manage the codebase, collaborate with team members and ensure the project integrity across iterations.

## Postman

A popular API testing tool that makes sending requests and debugging API endpoints easy. Postman is used during LingoLizard development to test the REST APIs for backend communication with the front end and Rasa.

# Flow Chart