SAVITRIBAI PHULE PUNE UNIVERSITY

Institute of Management Research & Technology [I.M.R.T],

MVP Campus, Shivaji Nagar, Gangapur Road, Nashik-422002

DESIGN DOCUMENT

Name of the student: - Bagul Sakshi Nitin

Class:- MBA (IT) - I

Semester: - II

Roll No.: - 05

Title of the Project: - WordWiz - Language Analyzer And Translator.

Name of the Guide: - Resp. Dr. D.V. Nandre Sir.

DESIGN DOCUMENT

Title: - Language Analyzer and translator.

Introduction

1.1 Purpose

A language translator dictionary, or bilingual dictionary, serves as an essential tool for individuals seeking to understand or convey words and phrases between two languages. Its primary purpose is to provide accurate translations, enabling users to grasp meanings, nuances, and appropriate usage in both the source and target languages.

1.2 Scope

The scope of language analyzers and translators encompasses a wide range of applications and functionalities, each playing a crucial role in facilitating effective communication and understanding across different languages.

1.3 Objectives

Language analysers are tools designed to process and interpret human language, breaking down text into its fundamental components to extract meaningful information. Their primary objectives include:

- **Text Processing and Tokenization**: Segmenting text into words, phrases, or sentences to aid in further analysis.
- **Morphological Analysis**: Identifying the root forms of words and their grammatical features, such as tense, mood, or number.
- **Syntactic Parsing**: Analyzing sentence structure to understand the grammatical relationships between words.
- **Semantic Analysis**: Determining the meanings of words and phrases in context to comprehend the text's overall message.
- **Language-Specific Processing**: Tailoring analysis techniques to accommodate the unique characteristics of different languages, such as handling specific alphabets, grammar rules, and idiomatic expressions.

2. System Architecture

1.4 Architectural Design

The architectural design of language analyzers and translators involves a series of interconnected components that work together to process, interpret, and translate human language. This design can be broadly categorized into traditional rule-based architectures and modern neural network-based architectures.

1. Rule-Based Machine Translation (RBMT) Architecture:

- RBMT systems rely on predefined linguistic rules and dictionaries to perform translations. A typical architecture includes:
- **Lexical Analysis**: Tokenizes input text into words and phrases, identifying their parts of speech and morphological features.
- **Syntactic Parsing**: Analyses sentence structure to understand grammatical relationships between components.
-

3. Hybrid Machine Translation Architecture:

Hybrid systems combine elements of RBMT and NMT to leverage the strengths of both approaches. Such architectures might integrate rule-based components to handle specific linguistic phenomena while employing neural networks for broader context understanding and fluency. This combination aims to balance linguistic precision with the ability to learn from data, potentially reducing the need for extensive manual rule development.

1.5 Technology Stack

- **Python**: Widely used for its extensive libraries and frameworks supporting NLP and MT tasks.
- **Java**: Employed for building robust NLP applications, offering a range of tools and libraries.
- **JavaScript (Node.js)**: Utilized for implementing NLP tools that run in JavaScript environments.

2. Design

2.1 ER Diagram

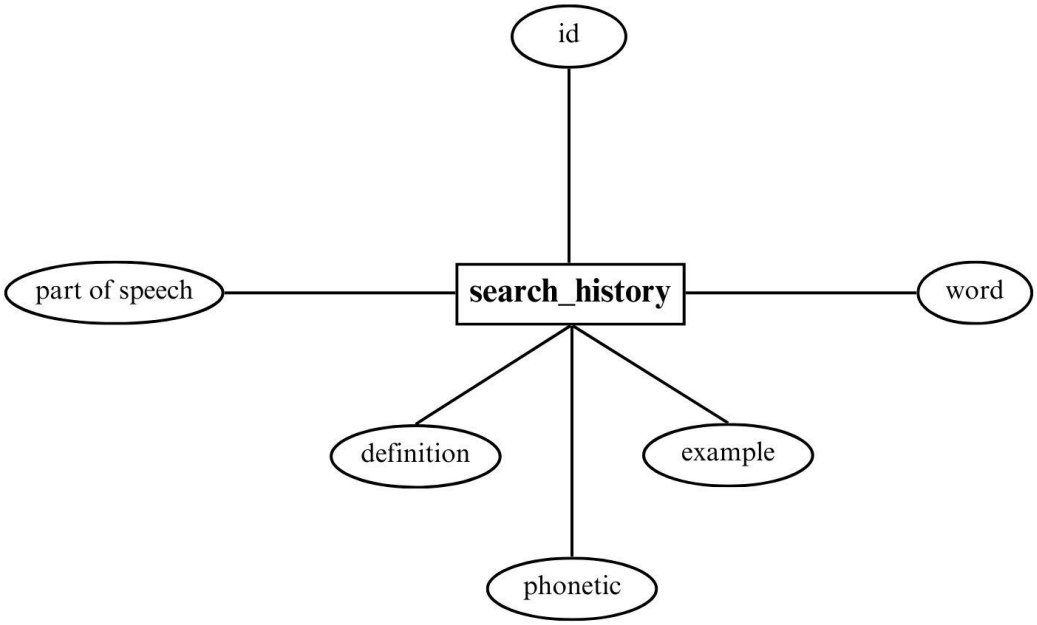

Fig. ER Diagram

2.2 Database Design Including Dictionary & File Layout

Search_History Table:

Column	Data Type	Constraint	Description
id	INT	Primary Key	Unique ID for each search entry
word	VARCHAR	-	The searched word
part_of_speech	VARCHAR	-	Noun, Verb, Adjective, etc.
phonetic	VARCHAR	-	Phonetic transcription of the word
definition	VARCHAR	-	Meaning of the word
example	VARCHAR	-	Example sentence (if available)
audio_url	VARCHAR	-	Stores the pronunciation audio URL
Search_at	Timestamp	-	Records when the word was searched

2.3 Use Case Diagram

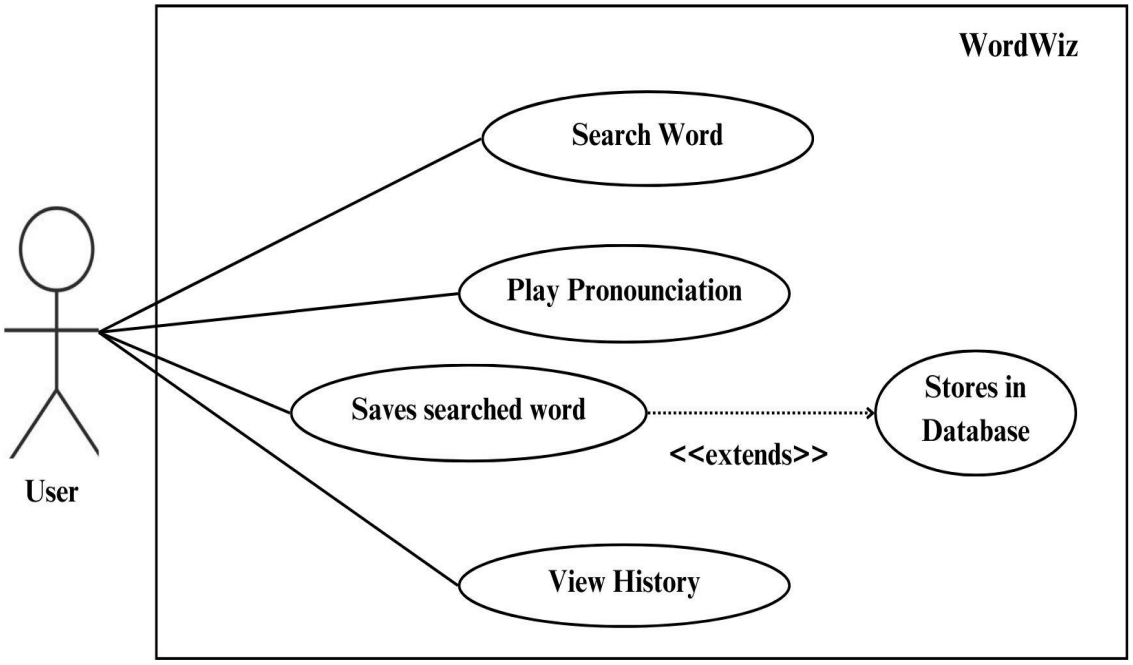

Fig.Use Case

2.4 Activity Diagram

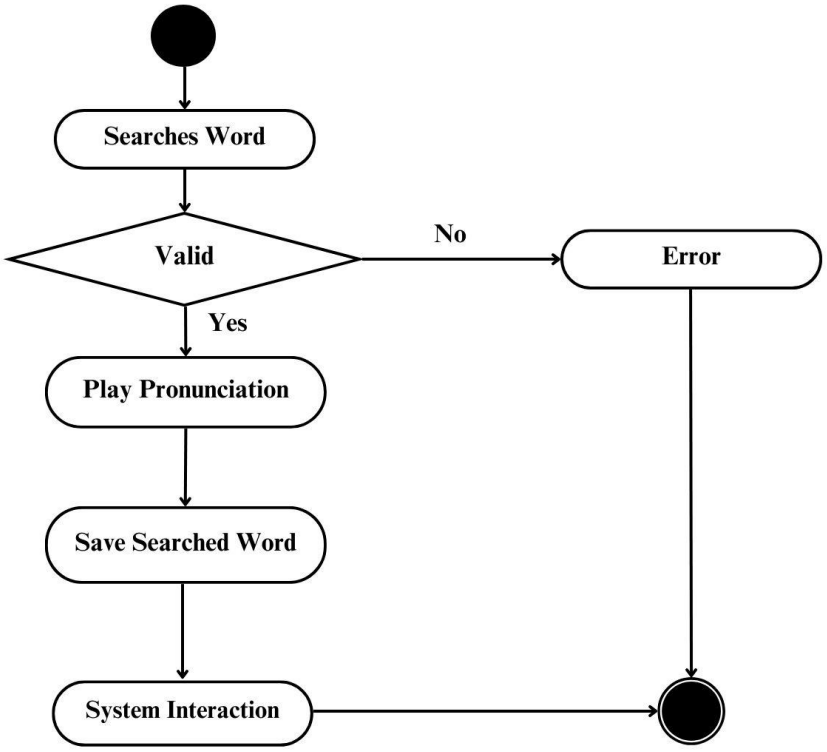

Fig. Activity Diagram

2.5 Component Diagram:

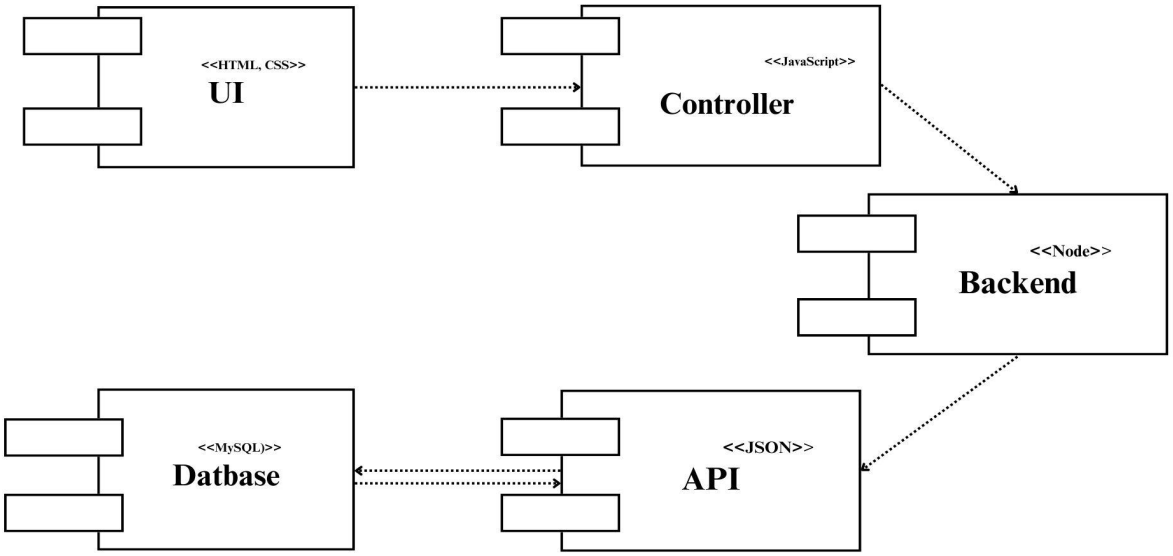

Fig. Component Diagram

2.6 Deployment Diagram:

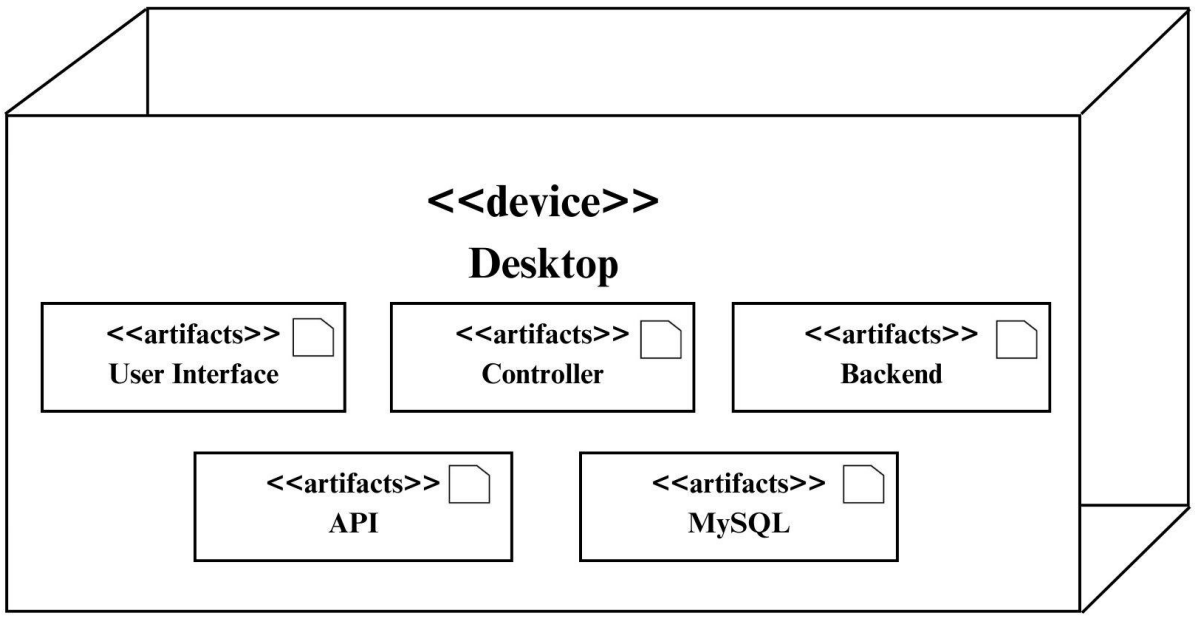

Fig. Deployment Diagram