Software Design Document

Team No: 21

Batch 2

Project Name: Aksharam

Team Members

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Project Guide

- Ms. Philo Sumi

Module Overview

1. **Letter Classification Module:** The user is shown how to write the character and then their written input is captured in the canvas provided. The image is pre-processed and sent to a classification model, which determines the correct alphabet and decides whether the user can proceed to the next letter.
   Components:

   - **Demo:** Demonstrates how to write the letter.
   - **Canvas:** The user then writes the letter on the given space.
   - **Classification Model:** The written letter is inputted to the model where it is classified.
   - **Result:** Determines whether the user can move on to the next character or not.

2. **Smart Scan Module:**
   The Image-Based Learning Module helps users learn Malayalam by extracting and translating text from images. Using an OCR model, the system detects Malayalam words in images, while a translation model converts them into the user's preferred language. This feature enhances learning by providing real-world examples, making language acquisition more interactive and engaging.
   Components:

   - **Image Input:** Users upload or capture an image containing Malayalam text.
   - **OCR Model:** Extracts Malayalam words from the image.
   - **Translation Model:** Translates the extracted text into the desired language.
   - **Result:** Shows the original and translated text for learning.

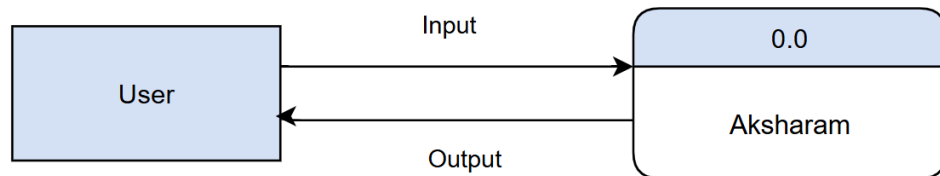3. **Words and Sentences Learning Module:**
   Helps users build their Malayalam vocabulary and conversational skills using a structured database. It teaches Malayalam words by displaying their meanings, pronunciation. Additionally, it introduces basic Malayalam sentences providing example sentences along with its English translations to enhance understanding and fluency.
   Components:

   - **Demonstrates the Word/Sentence:** Displays Malayalam words or sentences.
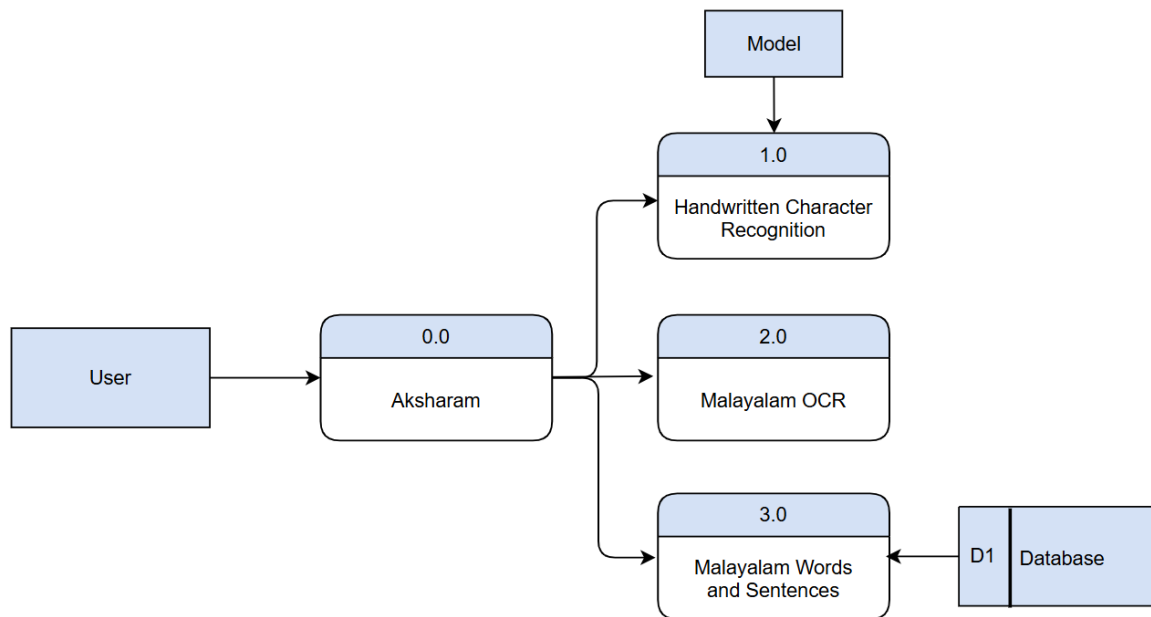   - **Provides English Translation:** Offers translations for better understanding.
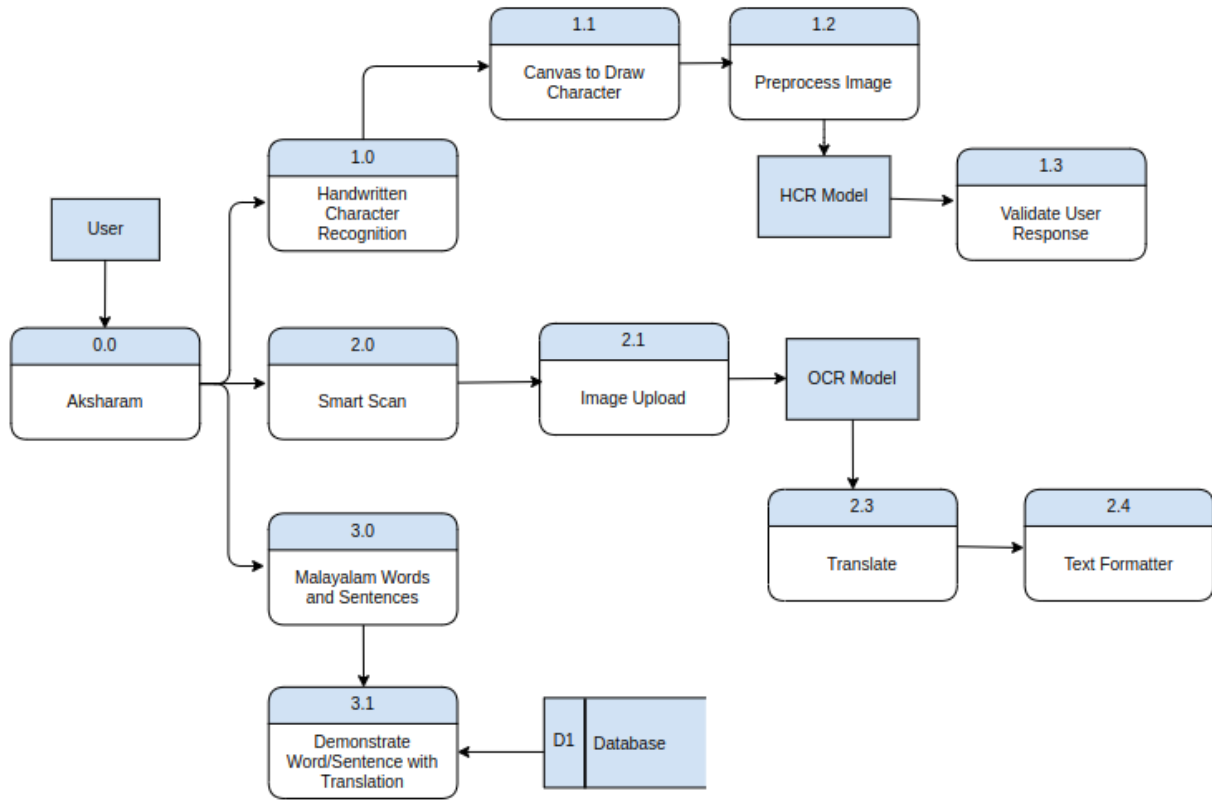
Data Flow Diagrams

Level 0 DFD

The Level 0 DFD shows the interaction between the User and the Aksharam system, where the User provides inputs like handwritten characters or images, and the system processes these to deliver outputs such as translations or learning materials.

Level 1 DFD

The Level 1 DFD expands the context diagram into three main modules: Handwritten Character Recognition, Malayalam OCR, and Malayalam Words and Sentences, each handling specific tasks for Malayalam language learning.

Level 2 DFD

The Level 2 DFD details the processes within each module, including character drawing and validation, image processing and translation, and vocabulary demonstration, all supported by a database for storing translations and learning materials.

Architecture Diagram