Problem Statement - 01
Kannada Speech-to-text Correction

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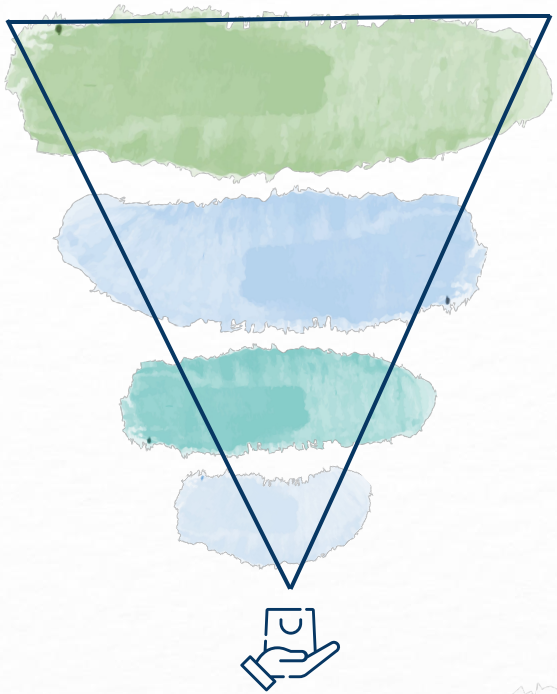
Problem Statement

Create an interactive system that takes your voice in Kannada, converts it to text, and helps identify confusing characters that might have been misrecognized—giving you options to choose the correct one! Think of it as building a "smart autocorrect" for Kannada that asks for your help when it's unsure. The system should detect similar-looking letters like ವ or ಮ, ಪ or ಫ, ಬ or ಭ, and also handle joined letters (ottaksharas) like ಕ್ಕ, ನ್ನ . You'll record yourself speaking three different paragraphs (easy, medium, hard) for about 3 minutes each, convert them to text using speech-to-text tools, and build a user-friendly interface that allows users to fix mistakes interactively.

Tech Stack



01 **Frontend**

React, Tailwind.css, daisyui

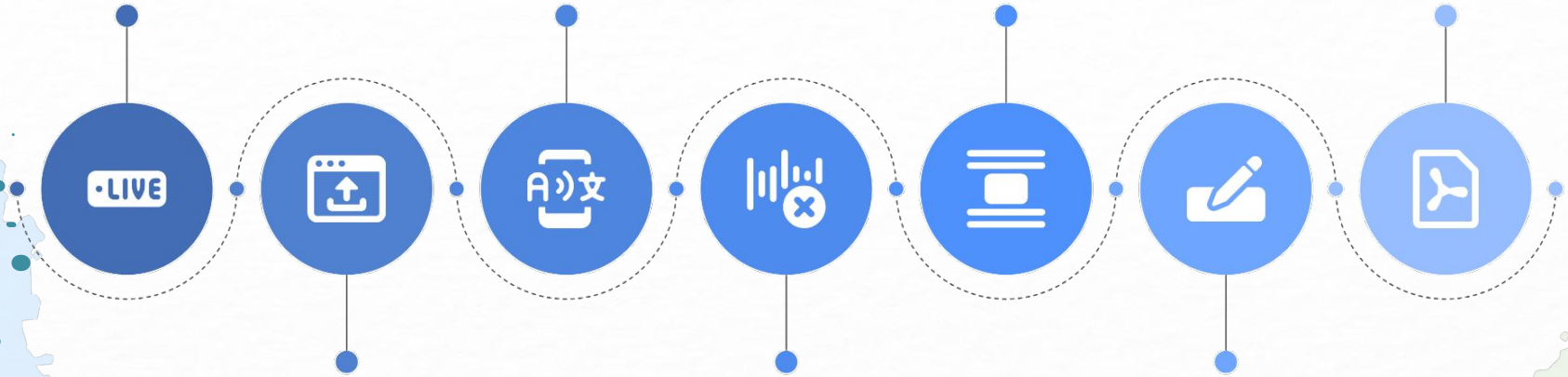
02 **Backend**

Node.js

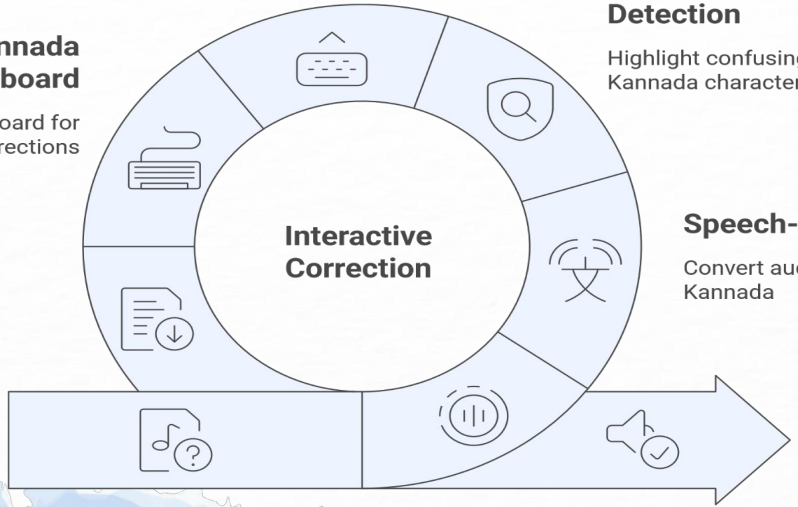
03 **Speech-to-text conversion API**

Elevenlabs - scribe_v1 and scribe_v2 models

Kannada Voice-to-Text Correction System Architecture



Key Features



Sample Output

```
============================================================
Kannada Transcription
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Section 1: Model Generated Text
------------------------------------------------------------
ಇಂದು ಬೆಳಿಗ್ಗೆ ನಾನು ಉದ್ಯಾನವನಕ್ಕೆ ಹೋಗುತ್ತಿದ್ದೆ ಅಲ್ಲಿಗೆ ಹೋ ಹೋದಾಗ ಗಾಳಿ ತುಂಬಾ ತಂಪಾಗಿ ಬೀಸುತ್ತಿತ್ತು ಪಕ್ಷಿಗಳ
ಕಲರವ ತುಂಬಾ ಮನಸ್ಸಿಗೆ ಸಂತೋಷ ನೀಡಿತು ಸ್ವಲ್ಪ ನಡೆಯುತ್ತಿದ್ದೆ ನಾನು ತುಂಬಾ ಶಾಂತಿಯನ್ನು ಅನುಭವಿಸಿದೆ


Section 2: User Corrected Text
------------------------------------------------------------
ಇಂದು ಬೆಳಿಗ್ಗೆ ನಾನು ಉದ್ಯಾನವನಕ್ಕೆ ಹೋಗುತ್ತಿದ್ದೆ. ಅಲ್ಲಿಗೆ ಹೋದಾಗ ಗಾಳಿ ತುಂಬಾ ತಂಪಾಗಿ ಬೀಸುತ್ತಿತ್ತು. ಪಕ್ಷಿಗಳ ಕಲರವ
ತುಂಬಾ ಮನಸ್ಸಿಗೆ ಸಂತೋಷ ನೀಡಿತು. ಸ್ವಲ್ಪ ನಡೆಯುತ್ತಿದ್ದೆ ನಾನು ತುಂಬಾ ಶಾಂತಿಯನ್ನು ಅನುಭವಿಸಿದೆ.


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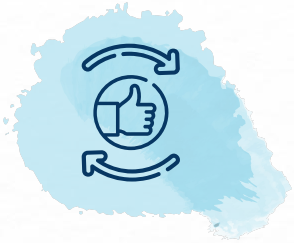
Evaluation Metrics



Word Error Rate (WER)

Scribe_v1 has WER<4.0% (less WER, better model)

Character Error Rate (CER)

Evaluates accuracy at the character level, including ottaksharas.

Confusion Detection Accuracy

If the confidence level of model is less than 0.8, then the model asks user for correction

Future Scope

Automatic grammar and context correction
Add Kannada grammar checks, punctuation correction, and semantic suggestions.

Adaptive confusion-letter learning
System automatically learns which characters users correct most and improves future predictions.

Mobile app version
Build Android/iOS versions with offline transcription using small on-device models.

Offline STT model integration
Integrate small Whisper/Vosk Kannada models for fully offline use.

Voice commands for correction
Allow users to say “replace with ಮು” or “next error” instead of clicking.