Implementation of Hindi Vocalizer on Cell Broadband Engine

Gaurangi, Jayati, Puneeth, Pushpendra and Sindhu
Team 10-c

Guide:
Prof. Shrisha Rao
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Introduction

Objective

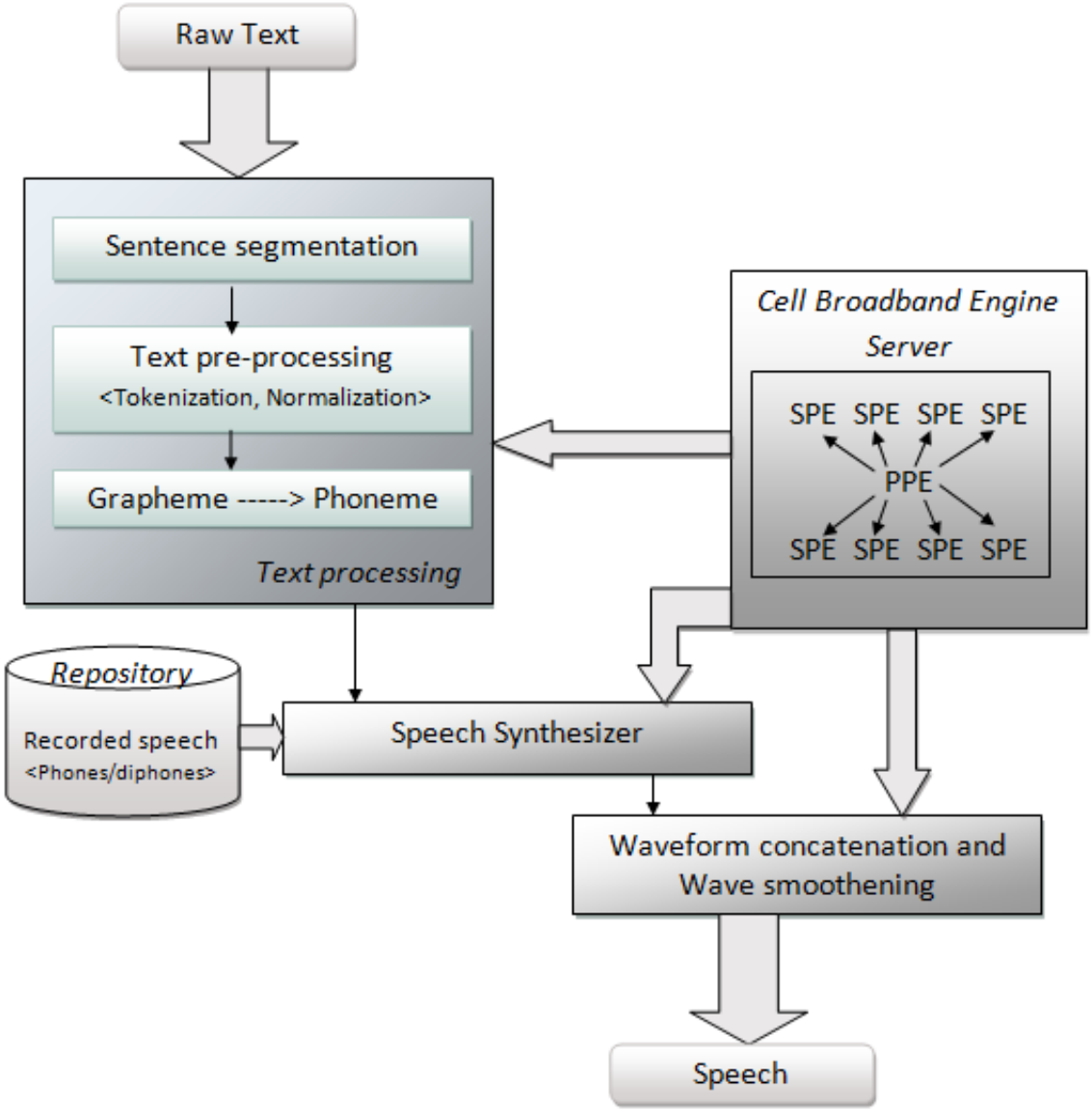
- To Develop a Text-to-Speech (TTS) application in Hindi.
- Implement the System on the Cell broadband Engine.

System Outline

Main Modules

- **Text Processor** - Text processing is used to convert the given text to a sequence of synthesis units
- **Speech Synthesizer** - generation of an acoustic wave form corresponding to each of these units in the sequence

System Architecture



Text Processor

- Input
- Tokenization
- Normalization
- Classification of Characters
- Grapheme to Phoneme Conversion
  - Conversion to Phonetic Transcription
  - Formation of Sound class
  - Correct Phonetic Transcription

Consonants

Hindi Character	Phonetic Symbol
'क'	'k'
'ख'	'kh'
'ग'	'g'
'घ'	'gh'
'ङ'	'nna'
'च'	'ch'
'छ'	'chh'
'ज'	'j'
'झ'	'jh'
'ञ'	'nna'
'ट'	'tt'
'ठ'	'tth'
'ड'	'dd'
'ढ'	'ddh'
'ण'	'nna'
'त'	't'

Hindi character	Phonetic Symbol
'थ'	'th'
'द'	'd'
'ध'	'dh'
'न'	'n'
'प'	'p'
'फ'	'ph'
'ब'	'b'
'भ'	'bh'
'म'	'm'
'य'	'y'
'र'	'r'
'ल'	'l'
'व'	'v'
'श'/'ष'	'sh'
'स'	's'
'ह'	'h'

Vowels

Vowel Notation	Vowels in Hindi	Phonetic Symbol
a	'अ'	1
aa	'आ' /'ा '	2
i	'इ'/'ि'	3
ii	'ई' /'ी'	4
u	'उ'/'ु'	5
uu	'ऊ' /'ू'	6
e	'ए'/'े'	7
ai	'ऐ'/'ै'	10
o	'ओ'/'ो'	11
au	'औ'/'ौ'	13

Halant

क्य	क्र	क्ल	क्व	क्श
ख्य	ख्र	ख्ल	ख्व	
ग्य	ग्र	ग्ल	ग्व	ग्न
घ्य	घ्र	घ्व	घ्न	
च्य	च्र	च्व		
ज्य	ज्व			
त्य	त्र	त्व		
थ्य	थ्र			
इ्य	इ्र	इ्व		
ध्य	ध्र	ध्व		
न्य	न्र	न्व		
ट्य	ट्र	ट्व		

Halant Contd..

ड्य	ड्र	ड्व
ध्य	ध्र	ध्व
न्य	न्र	न्व
ट्य	ट्र	ट्व
ड्य	ड्र	ड्व
प्य	प्र	प्ल
फ्र	फ्ल	
ब्य	ब्र	ब्ल
भ्य	भ्र	भ्ल
म्य	म्र	
व्य	व्र	व्ल

Example-Phonetic Symbol

Hindi Character	Phonetic Symbol
म	m
◌ु	5
ब	b
◌ा	2
र	r
क	k

Example-Character Classification

Hindi Character	Character Classification
म	C
ु	V
ब	C
ा	V
र	C
क	C

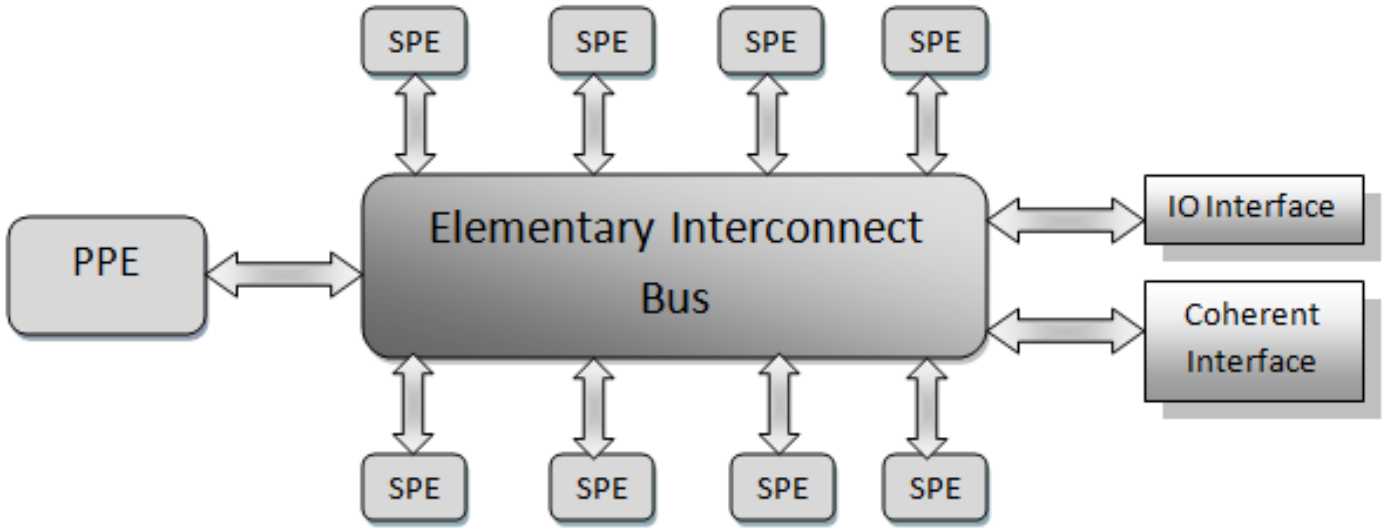
Correct Phonetic Transition

Word	Phonetic Transcription	Classification of Characters	Sound Classes	Correct Phonetic Transcription
मुबारक	m5b2rk	CVCVCC	CV CV CVC	m5 b2 r1k

Speech Synthesizer-Waveform Generator

- Phoneme Mapping using Speech Database
- Waveform concatenation
- Waveform Smoothening

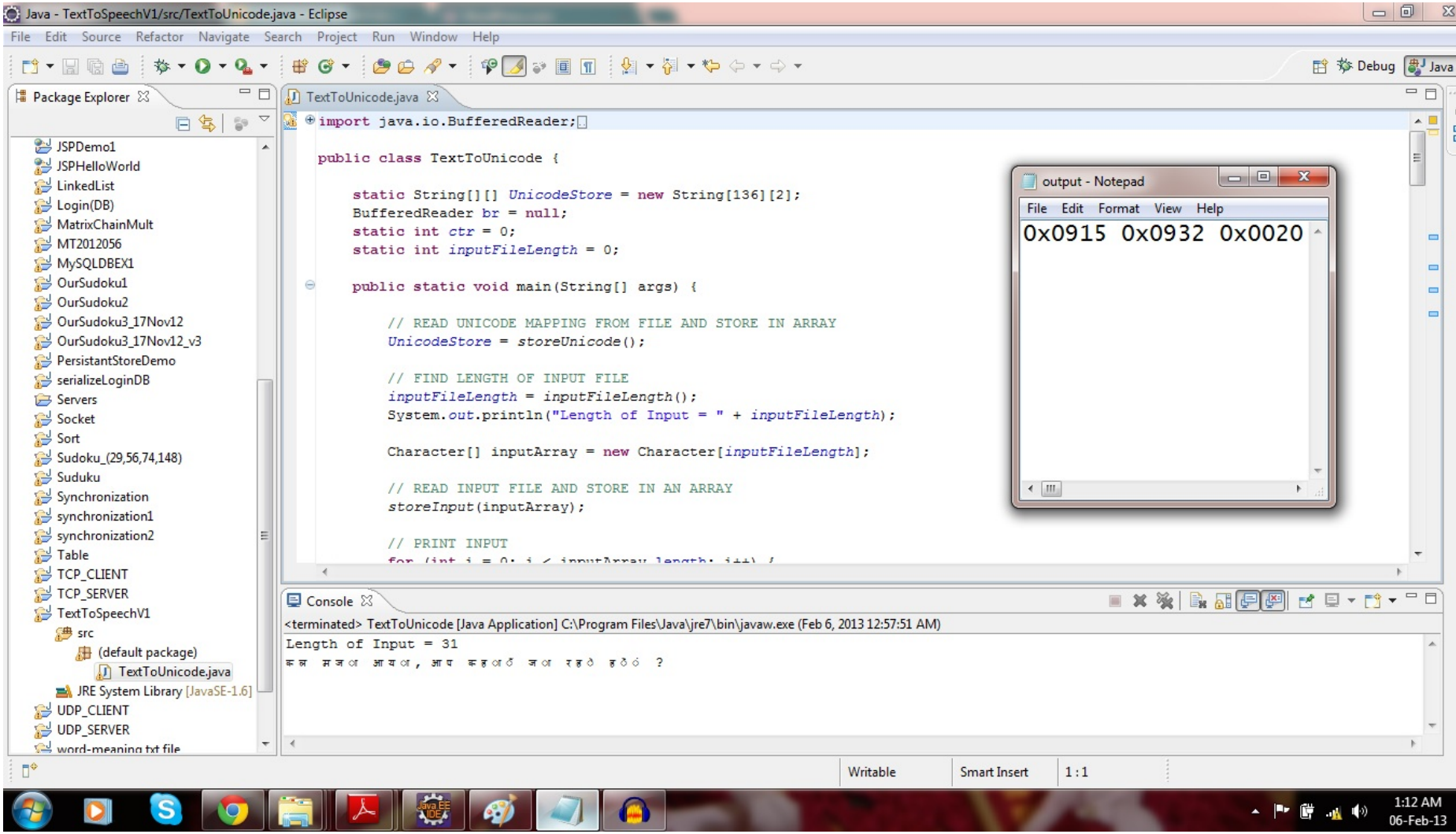
CBE Architecture



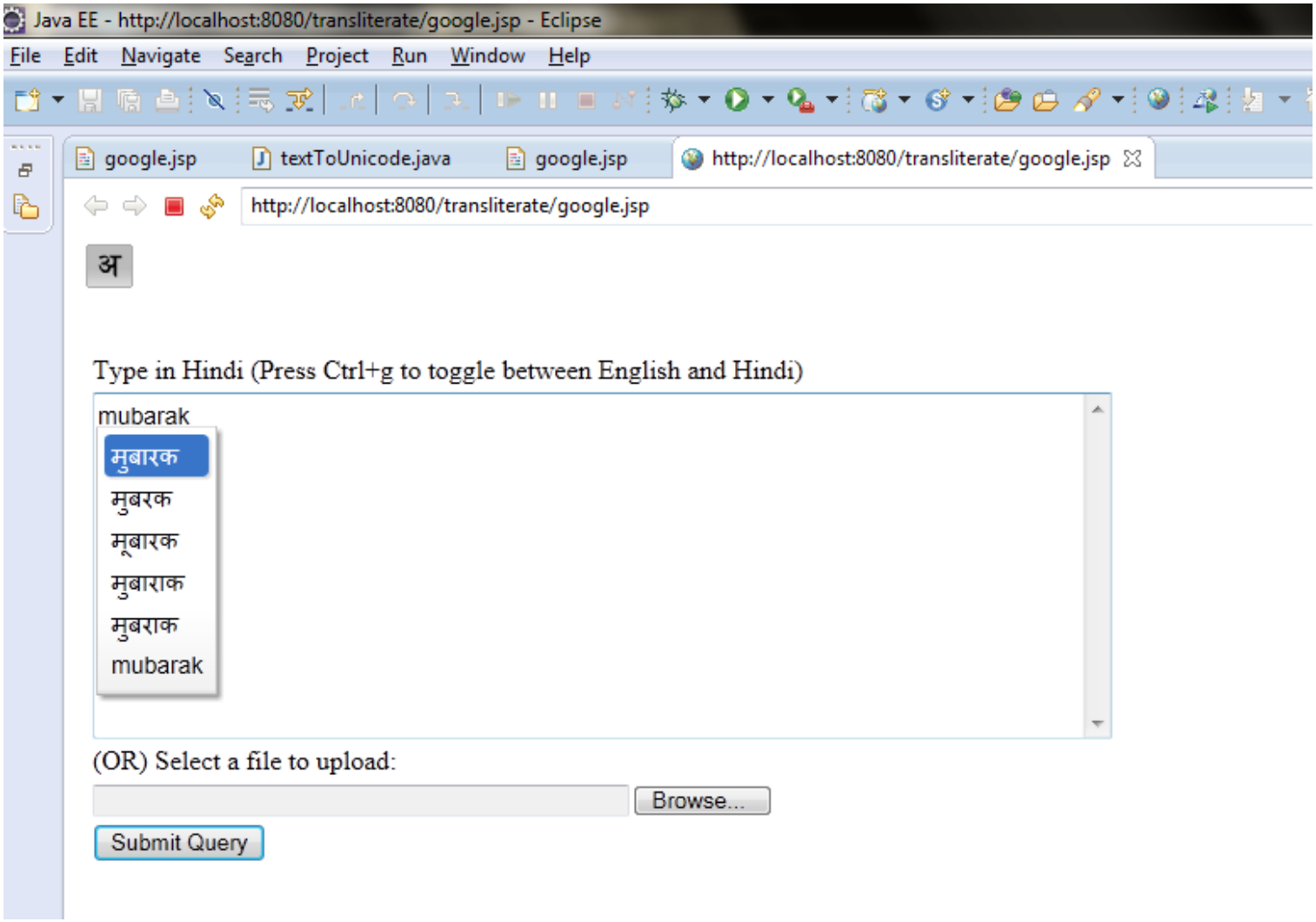
Work Done Till Now:

- Text Input Module
- Transliteration
- Analysis of Potential Databases
- CBE Installation
- Study of Research papers and Open source softwares

Text Mapping



Transliterate



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Thank You