

Outline

- Issues with interpreting text input
 - ▶ <transliterate>

- Handling foreign words
 - ▶ <foreign>

- Conclusions



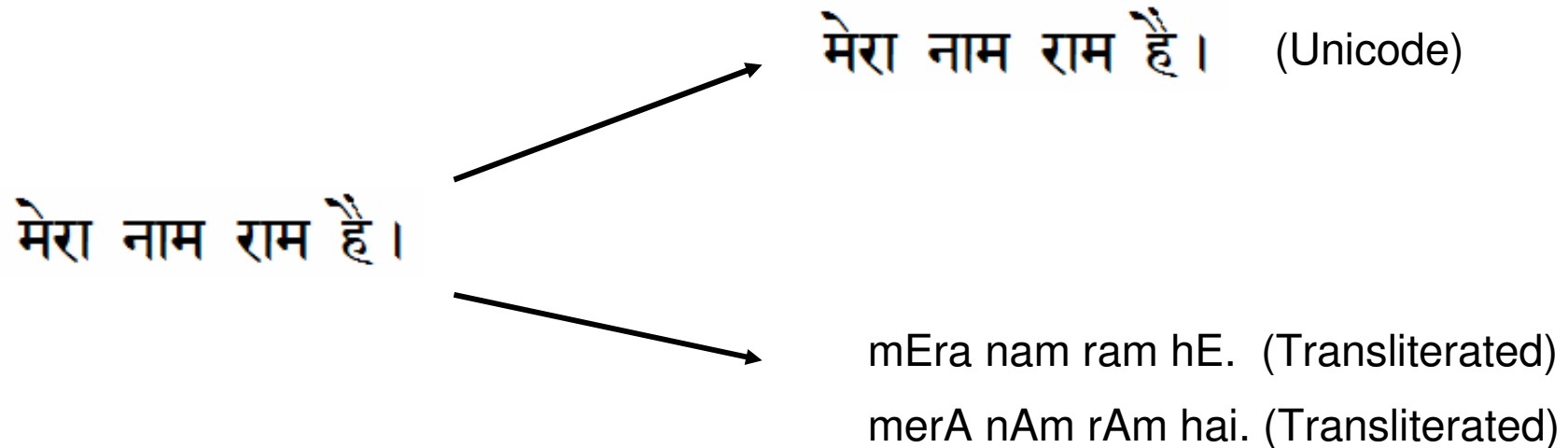
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Interpreting the input by SSML

- Text input to most Indian language TTS systems is either
 - an English transliteration of the Indian language script or
 - in Unicode – supports Devanagiri, Bengali, Telegu, Tamil etc but not all 18 official languages



- ITRANS is a popular transliteration scheme but various other schemes are also in use.

Interpreting the input by the TTS vocabulary

- TTS systems maintain a vocabulary of words that define the pronunciation for each word
 - ▶ मेरा - M EY R AA
 - ▶ नाम - N AA M
 - ▶ राम - R AA M
 - ▶ है - H AE
- The mapping from the SSML documents to the TTS vocabulary needs to be the same

```
<?xml version="1.0"?>
  <ssml version="1.0" xml:lang="in">
    मेरा नाम राम है
  </ssml>
```

will not work with

merA		M EY R AA
nAm		N AA M
rAm		R AA M
hai		HH AE

Interpreting the input

- Both the TTS and the user use Unicode – there are no issues in interpreting the input

```
<?xml version="1.0"?>  
    <say version="1.0" xml:lang="in">  
        मेरा नाम राम है  
    </say>
```

- This option is currently supported in SSML 1.0
- The input in many cases is however transliterated



Proposed tag for correct interpretation of input

Tag Reference

`<transliterate>` - indicate transliterated input

Attributes

Name	Value	Required	Summary
codepage	[0-9]*	Yes	character encoding table number
uri	URI	No	location of external transliteration scheme

An example of <transliterate> tag

- There should be a mechanism to indicate whether the input has been transliterated or not
- If the input is transliterated, there should be a way to know which scheme has been used

*Transliterated
using a scheme*

```
<?xml version="1.0"?>
<speak version="1.0" xml:lang="in">
  <transliterate codepage="1252" uri="http://www.example.com/trans.file">
    merA nAm rAm hai
  </transliterate>
</speak>
```

No transliteration

```
<?xml version="1.0"?>
  <speak version="1.0" xml:lang="in">
    <transliterate codepage="1137">
      मेरा नाम राम है
    </transliterate>
  </speak>
```


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Handling foreign language words

- The input text in many cases contains words or phrases in other languages – e.g. loan words. These need to be pronounced differently.

मैं पोस्ट-ऑफिस कार से जा रहा हूँ (I am going to the post office by car)

I greeted her with a **namaste** and showed her where she could get a ticket for the movie **jaane bhi do yaron**

Bon voyage friends!



Handling foreign language words (Existing solution #1)

- An option to represent this using SSML 1.0 would be

```
<?xml version="1.0"?>
  <spek version="1.0" xml:lang="en-US">
    I greeted her with a
    <s xml:lang="in"> नमस्ते </s>
    and showed her where she could get a ticket for the movie
    <s xml:lang="in"> जाने भी दो यारो</s>
  </spek>
```

- **Problems –**

- ▶ a single sentence now needs to be split up into several incorrect document structures to make use of the `xml:lang` attribute.
- ▶ there is no option to indicate `xml:lang` attribute for words or phrases.
- ▶ Primary use of `<s>`, `<p>` is to explicitly indicate document structure, providing clues to indicate prosodic variations - reusing them for mark foreign words is not clean.

Handling foreign language words (Existing solution #2)

- An option to represent this using SSML 1.0 would be

```
<?xml version="1.0"?>
  <ssml version="1.0" xml:lang="en-US">
    I greeted her with a
    <phoneme ph="N AX M AX S TX EY"> namaste </phoneme>
    and showed her where she could get a ticket for the movie
    <phoneme ph="JH AA N EY BH IY DH OW Y AA R OWN"> jaane bhi do yaron
  </phoneme>
</ssml>
```

- **Problem**

- ▶ Most developers are not conversant with phonetic representations - difficult and error prone

Handling foreign language words (Existing solution #3)

- Another option to represent this using SSML 1.0 would be

```
<?xml version="1.0"?>
```

```
<speak version="1.0" xml:lang="en-US">
```

```
<lexicon uri=" www.example.com/lexicon.file"
```

I greeted her with a **namaste** and showed her where she could get a ticket for the movie **jaane bhi do yaron**

```
</speak>
```

- Problem**

- ▶ Words spelt the same way may get wrongly pronounced

Proposed tag for handling foreign language words

Tag Reference

`<foreign>` - indicate foreign words or phrases

Attributes

Name	Value	Required	Summary
lang	a language identifier	Yes	character encoding table number
uri	URI	Yes	location of external pronunciation dictionary

An example of <foreign> tag

- A tag that could represent foreign words or phrases and also indicated the pronunciations to be used for the words

```
<?xml version="1.0"?>
  <speak version="1.0" xml:lang="en-US">
    I greeted her with a
    <foreign lang="in" uri="http://www.example.com/lex.file">
      namaste </foreign>
    and showed her where she could get a ticket for the movie
    <foreign lang="in" uri="http://www.example.com/lex.file">
      jaane bhi do yaron</foreign>
  </speak>
```



Conclusions

- Two extensions in the context of Indian languages have been proposed based on our experience
 - ▶ <transliterate>
 - ▶ <foreign>

