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**Workshop on Internationalizing SSML III
Hyderabad, India – 3 Jan 2007**

Pronunciation Lexicon Background

Outline

- **Brief Introduction on Pronunciation Lexicon Specification**
- **Common Use Cases**
 - Homographs solution
- **Other relevant issues for the workshop**

Why Pronunciation Lexicon Specification?

- Address most common cases of pronunciation customization
- Enrich TTS and ASR with customized pronunciations
- Complete the “Speech Interface Framework”

→ Read the specification at:

<http://www.w3.org/TR/pronunciation-lexicon/>

What PLS 1.0 is Not!

- **Multilingual pronunciation lexicon**
→ the current specification is mono-lingual!
- **Advanced features**
→ no syntax, no semantics, no morphology, no compound words
- **TTS-internal lexicon**
→ too complex and rich of custom knowledge

PLS 1.0 is restricted to the most important and tractable issues.

The PLS 1.0 Language

- PLS is an XML language

```
<?xml version="1.0" encoding="UTF-8"?>
```

- The root element is `<lexicon>`,
with attributes `version`, `xmlns`, `alphabet`, `xml:lang`
- It contains a collection `<lexeme>`s, which are composed of:
 - `<meta>` and `<metadata>` for metadata
 - `<grapheme>`s for orthographies/spellings
 - `<phoneme>`s for pronunciations
 - `<alias>`s for textual substitutions
 - `<example>`s for examples
- ➔ *The order of `<lexeme>`s is relevant to determine the preferred pronunciation for TTS*

PLS Common Use Cases

- **Multiple pronunciations**
 - For ASR: to accommodate speaker/regional variability, not native speakers
 - For TTS: a single preferred pronunciation will be selected
- **Multiple orthographies (with same pronunciations)**
 - Useful for both ASR & TTS
- **Homophones (same pronunciations, different meanings)**
 - Different <lexeme>s with same or overlapping <phoneme>s
- **Homographs (same spellings, different pronunciations)**
 - This is hard! How to differentiate <lexeme>s with same <grapheme>s

Homographs Proposed Solution

- New “role” attribute on <lexeme> elements
`<lexeme role="value"/>`
- Values are QNames (qualified names, with a namespace)
e.g. “myvocabulary:verb”, “wordnet:verb”, “claws:VV1”
- Open to future standardization
→ both proprietary values and if future standard ones
- More than one QName for a single <lexeme> entry
e.g. `role="w:verb w:past-tense"`

Example of Homographs in PLS

```
<?xml version="1.0" encoding="UTF-8"?>
<lexicon version="1.0"
  xmlns=http://www.w3.org/2005/pronunciation-lexicon
  xmlns:claws="http://www.example.com/claws7tags"
  alphabet="ipa" xml:lang="en-GB">
  <lexeme role="claws:VVI claws:VV0 claws:NN1">
    <!-- verb infinitive, verb present tense, singular noun -->
    <grapheme>read</grapheme>
    <phoneme>ri:d</phoneme>
  </lexeme>
  <lexeme role="claws:VVN claws:VVD">
    <!-- verb past participle, verb past tense -->
    <grapheme>read</grapheme>
    <phoneme>red</phoneme>
  </lexeme>
</lexicon>
```

“Can you read this book to me?”
“I already read it three times!”

SSML 1.1 Includes the role Attribute

```
<?xml version="1.0" encoding="UTF-8"?>
<speak version="1.1"
  xmlns="http://www.w3.org/2001/10/synthesis"
  xmlns:claws="http://www.example.com/claws7tags"
  xml:lang="en-US">

  <lexicon uri="http://www.example.com/example.pls">

    <voice gender="female" age="3">
      Can you <w role="claws:VVI">read</w> this book to me?
    </voice>

    <voice gender="male" age="44">
      I've already <w role="claws:VVN">read</w> it three times!
    </voice>

  </speak>
```

... SRGS should be extended too!

Another Example from SSML 1.1

- See second example of SSML 1.1 Section 3.1.8

<http://www.w3.org/TR/2007/WD-speech-synthesis11-20070110/#S3.1.8>

Other Issues for the Workshop

- **Lexicon selection criteria in SSML 1.1**
- **Allow other phonetic alphabets?**
 - Current PLS 1.0:
 - mandates the use of IPA (International Pronunciation Alphabet)
`alphabet="ipa"`
 - allow proprietary phonetic alphabets)
`alphabet="x-organization-alphabet"`
 - SSML 1.1 is proposing a IANA registry for alternate pronunciation alphabets
- **Other issues?**