
Arabic Phonetic Web Sites Platform Using VoiceXML

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Plan

- ▶ **Problem**
- ▶ **Objectives**
- ▶ **Platform**
 - ▶ VoiceXML interpreter
 - ▶ Arabic Language Specification
 - ▶ Arabic TTS
 - ▶ Arabic ASR
- ▶ **Proposal**
 - ▶ VoiceXML interpreter
 - ▶ Arabic TTS
 - ▶ Arabic ASR
- ▶ **Conclusion**
- ▶ **Future work**

Problem

- ▶ Traditional web surfing <> VoiceXML technology.
- ▶ Telephony devices = web browser.
- ▶ Some people (handicapped) can't use internet or computer as we do.
- ▶ **No Arabic support by currently existed VoiceXML platforms.**

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Objectives

- ▶ To develop VoiceXML interpreting platform provides Arabic language support.
 - ▶ Arabic TTS.
 - ▶ Arabic ASR.
 - Distributed platform:
 - ▶ Server=VoiceXML Documents & web server.
 - ▶ Client=VoiceXML interpreting,Arabic TTS & Arabic ASR.

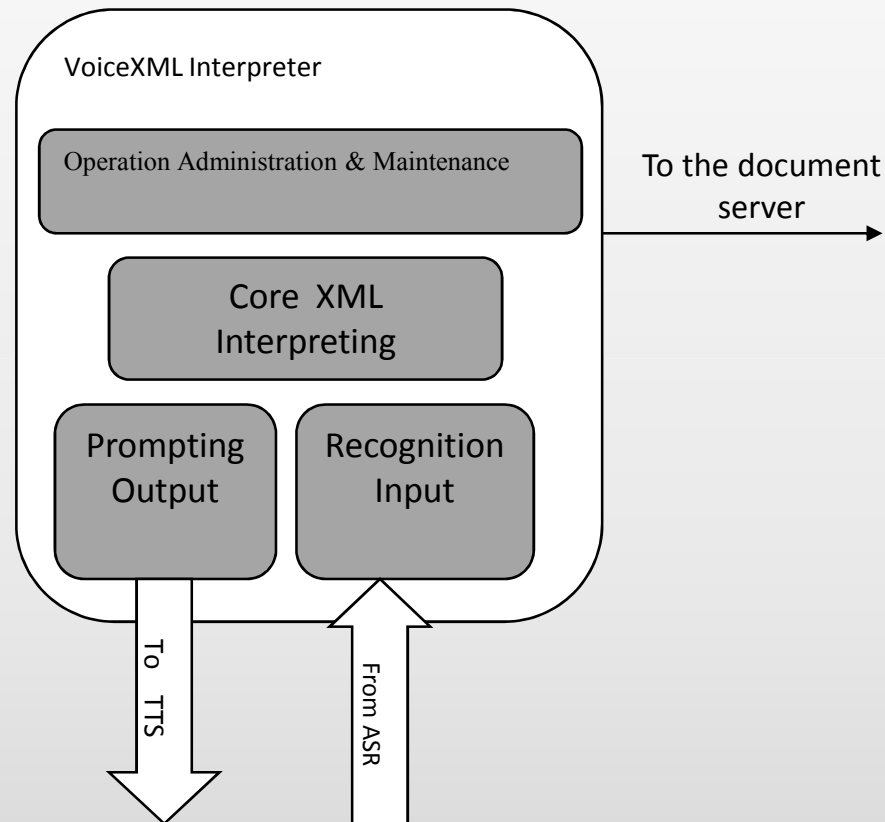
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VoiceXML Interpreter

- ▶ **VoiceXML Interpreter:**

- ▶ OA&M
- ▶ Core XML interpreting
- ▶ Prompting output
- ▶ Recognition input



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Arabic Language Specification

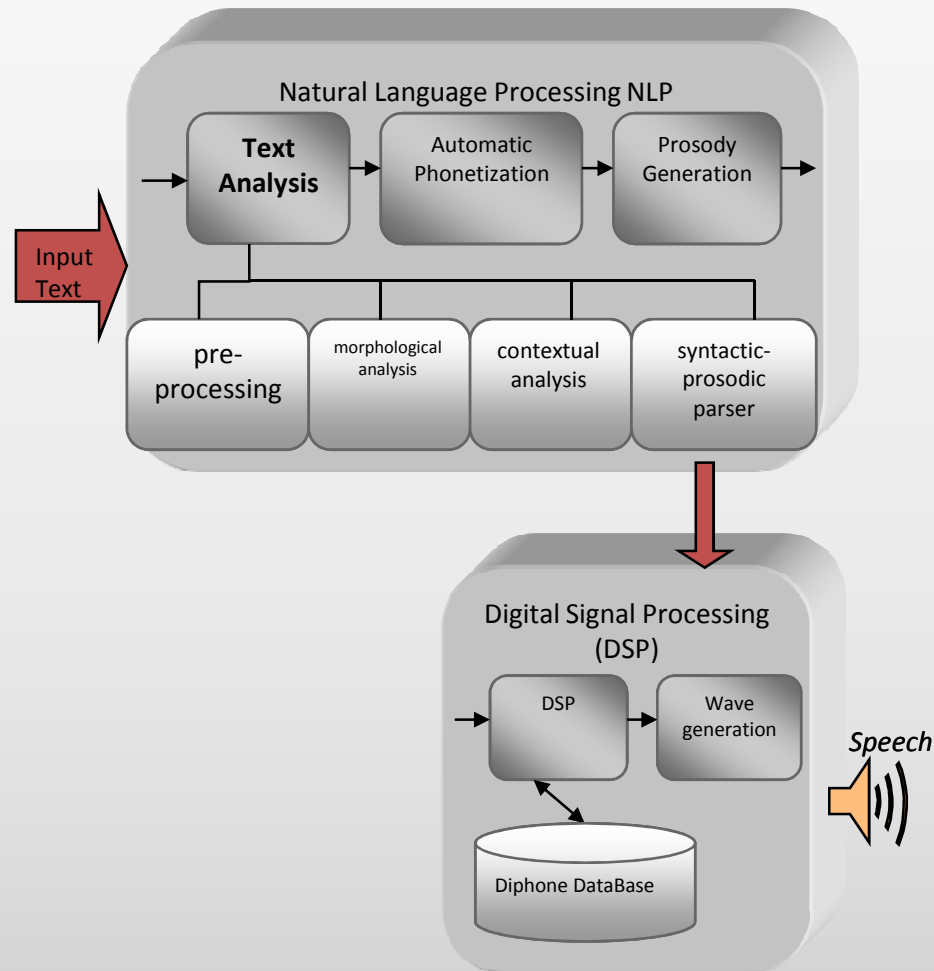
- ▶ Sentences may be:
 1. Nominal: start with noun or preposition.
 2. Verbal: start with a verb.
 3. Question: end with question mark (؟).
- ▶ Punctuation marks: (. / ، / : / ؟ / !): determine how to read the sentence.

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Arabic TTS

- NLP: Natural language processing
 - Text analysis
 - Automatic Phonetization
 - Prosody Generation
- DSP: digital signal processing.



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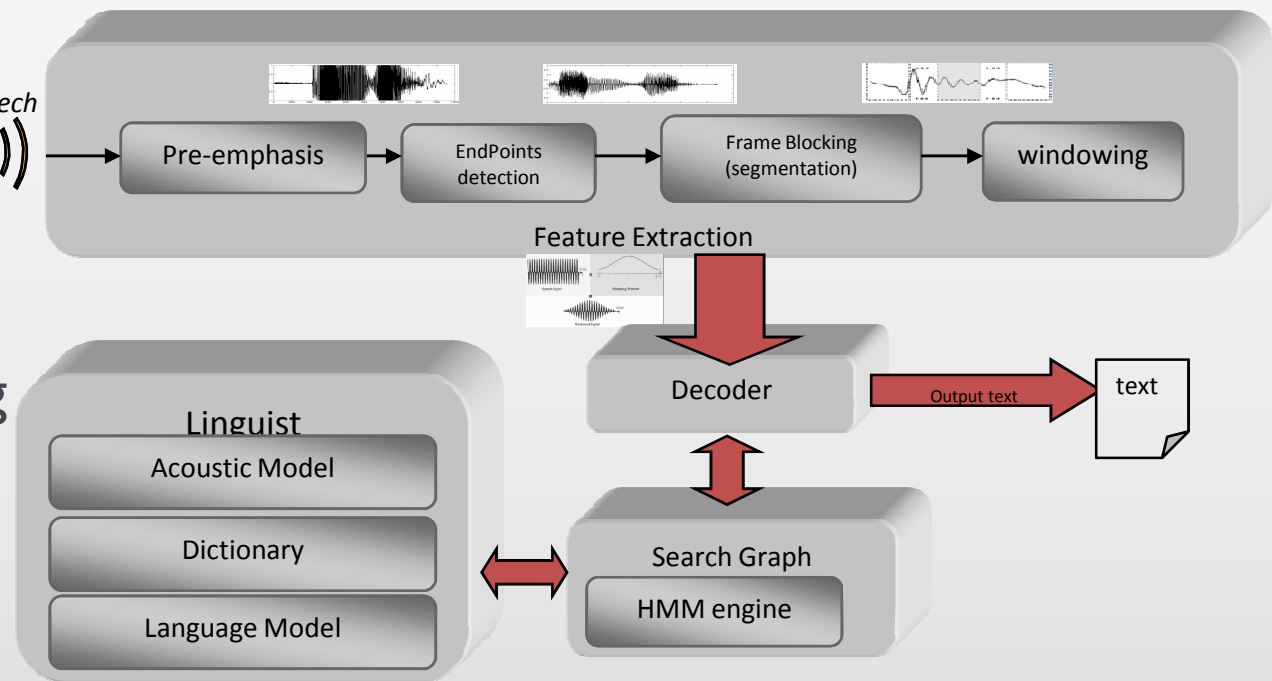
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Arabic ASR

- ▶ Feature Extraction:

- ▶ Pre-emphasis
- ▶ EndPoints Detection
- ▶ Frame Blocking
- ▶ Windowing

- ▶ Linguist:
- ▶ Search Graph:
- ▶ Decoder:



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VoiceXML Interpreter

- ▶ **VoiceXML Interpreter:**
 - ▶ Using OpenVXI:
 - ▶ Standardized interpreting and interfaces (prompting output & recognition input).
 - ▶ Now: Build simple interpreter support some tags:
 - ▶ <form>, <menu>, <prompt>, <field>, <grammar>, <assign>
.....

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Arabic TTS

- ▶ Using MBROLA diphone database and Arabic voice (ar1).
 - ▶ MBROLA doesn't convert from raw text to voice, but only from phonemes to voice.
- ▶ Build a program to convert from Arabic text to correspondent MBROLA phonemes.

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Arabic ASR

- ▶ After search: choosing CMU Sphinx for Automatic Speech Recognition:
- ▶ Training CMU Sphinx to recognize needed Arabic words
- ▶ Sphinx uses JSGF to perform speech recognition.
 - ▶ Supported by <grammar> tag

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Conclusion

- ▶ We wish we can support a new important technology for Arabic world
- ▶ We wish our work to motivate researchers to provide Arabic language tools:
 - ▶ Acoustic Model, Language Model, and dictionary.

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Future work

- Support SSML (speech synthesis markup language).
- Allow for DTMF entry by telephone devices.

Thanks .