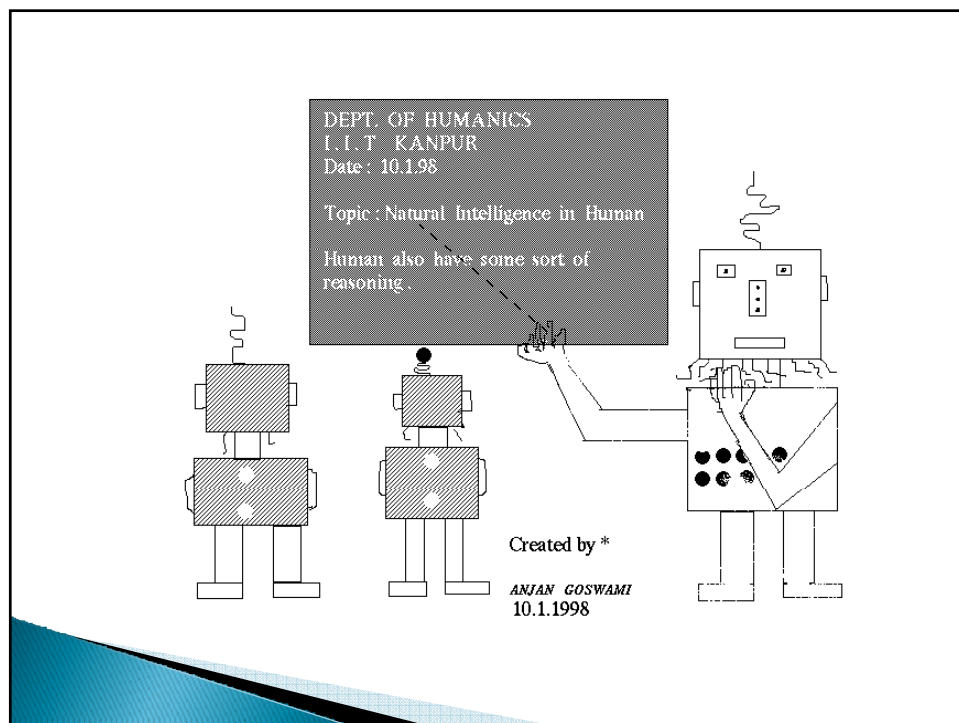
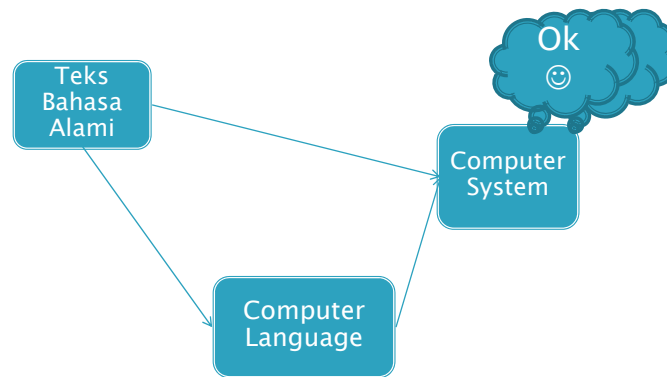


Pemrosesan Bahasa Alami (Natural Language Processing)

Ayu Purwarianti
Lab Grafik dan Intelegensia Buatan



Apa itu PBA?



Alice...

► Chat Robot

► Example:

- *Human: can you change how you look?*

ALICE: Yes the ALICE robot is fully parameterized.

Human: how to parameterize it?

*ALICE: What is it to be?
I haven't heard or to parameterize it.*

Human: I mean, I want to see you with other cloth

ALICE: Oh I get it. Thanks for explaining that. Is it a movie?

Human: No of course not

ALICE: A boot? A TV show? Then what is it?

Text Understanding

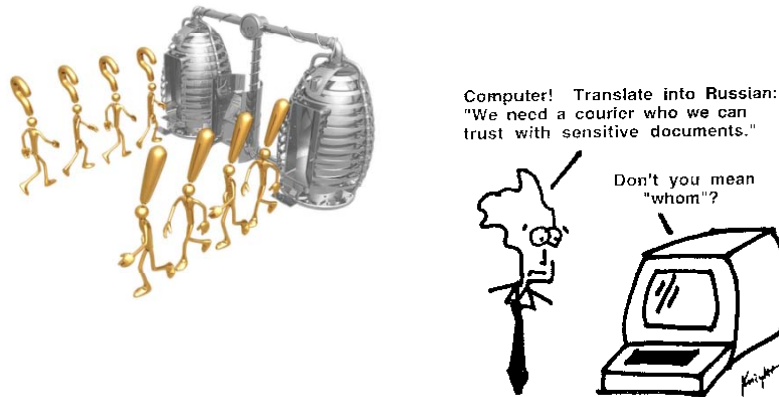
Masalah dalam PBA

- ▶ Ambiguitas
 - Jenis kata
 - Representasi sintaks kalimat
 - The manager of Yaxing Benz, a Sino-German joint venture
 - The manager of Yaxing Benz, Mr. John Smith
 - Arti kata
 - bank, bass
 - Arti kalimat
 - John bought a car with Mary
 - Pengacuan objek pada teks
 - John needed a car to go to his new job. He decided that he wanted something sporty. Bill went to the Acura dealership with him. He bought an integra.
- ▶ Ketidaklengkapan pengetahuan

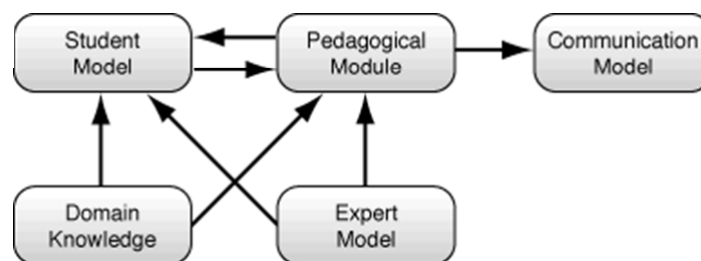
Contoh Tools Pemroses Bahasa

- ▶ Spelling/Grammar Checker
- ▶ Report Generation
- ▶ Analisis/sintesis kata-kalimat:
 - Morphology
 - Syntax
 - Semantics
 - Pragmatics

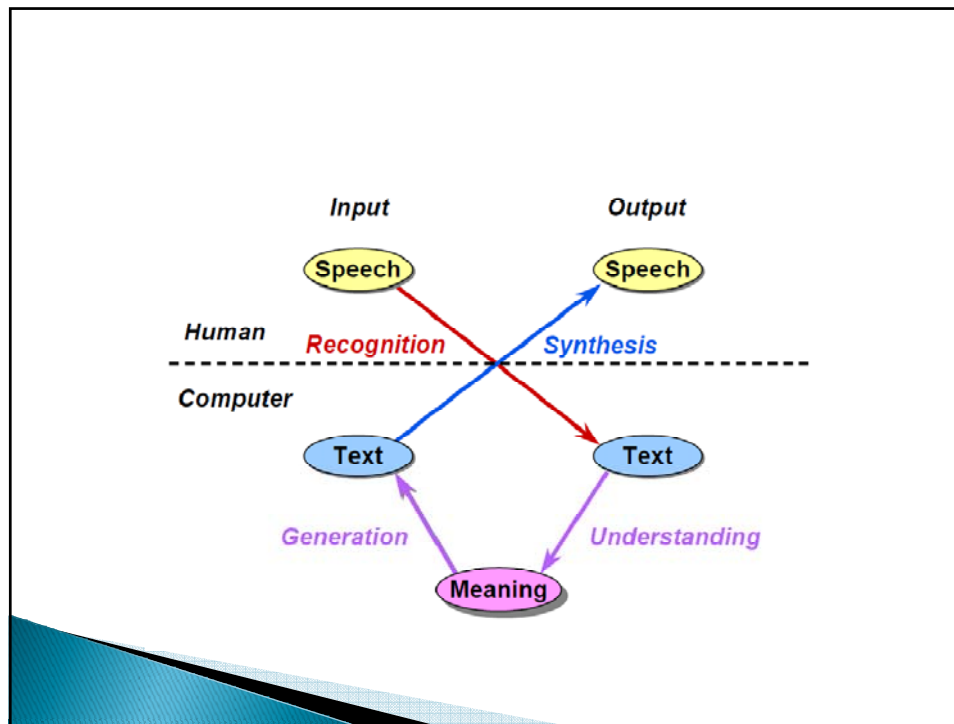
Machine Translation



Intelligent Tutoring System



- ▶ Student Evaluation
 - Essay Scoring
 - Test Generator



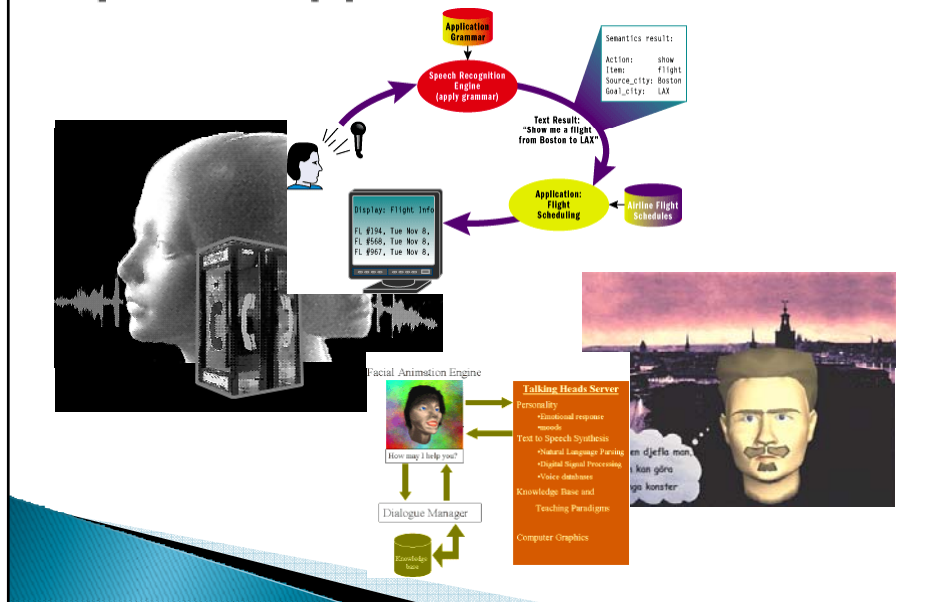
Speech to Text/Speech Recognition

- ▶ Input: speech; Output: text
 - Limited vs open vocabulary
 - Speaker dependent vs independent
 - Batch vs real time
- ▶ Teknik
 - Rule based
 - Statistical based → machine learning
- ▶ Masalah
 - OOV
 - Noise
 - filler

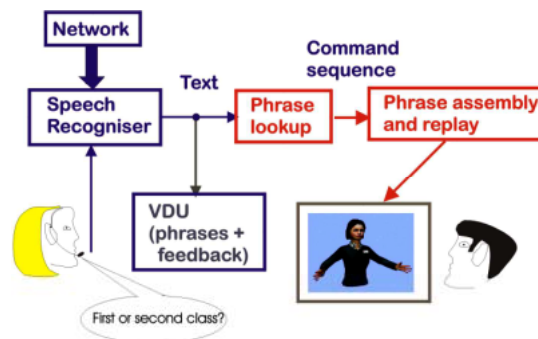
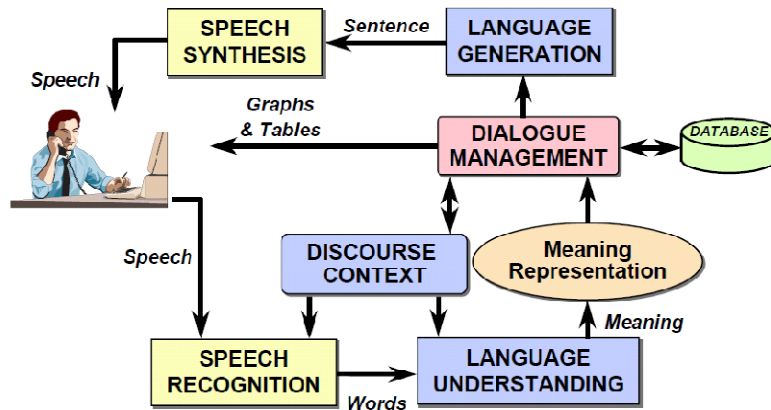
Text to Speech / Speech Synthesis

- ▶ Input: text; Output: speech
 - Email
 - Dokumen
- ▶ Teknik
 - Per fonem – gabungan fonem
 - Per kata
- ▶ Masalah
 - Intonasi
 - OOV

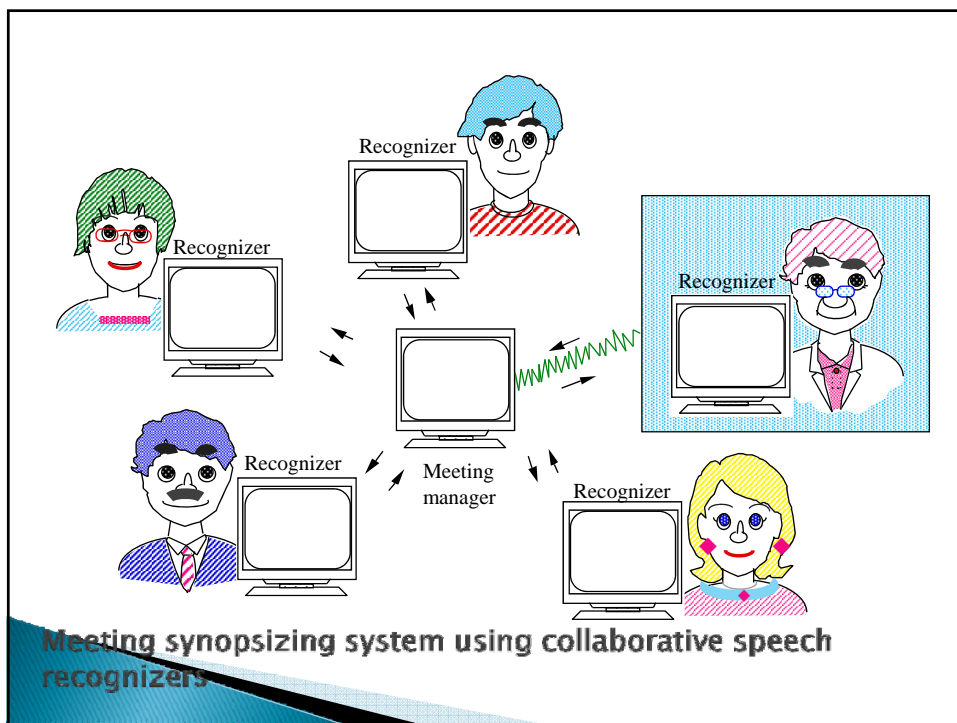
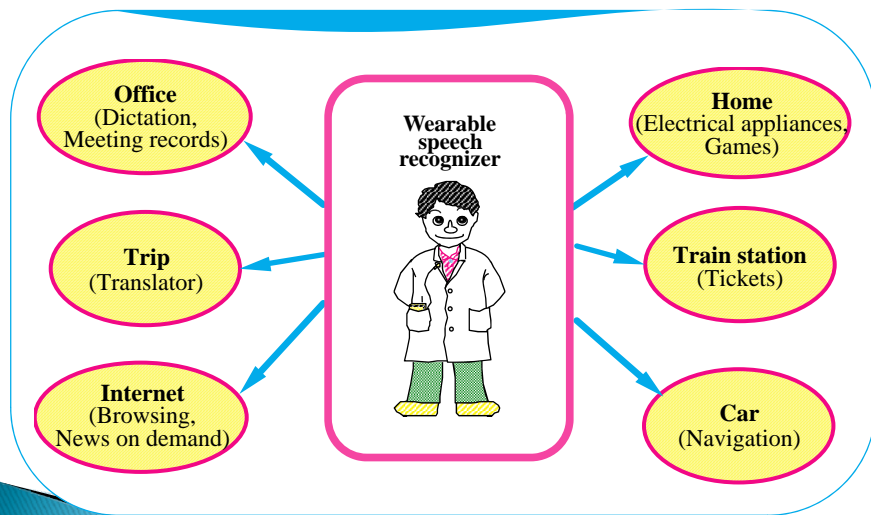
Speech Application



Sistem Dialog



Lingkungan Ubiquitous/Wearable Computing



Robot



ASIMO



AIBO



KUKA



ROBOCUP

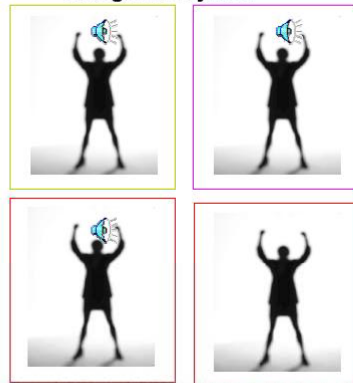
Speaker Recognition

Unknown Speaker
requesting access



Which of the speakers in the recognition
system is the unknown speaker ?

Speakers known to the
recognition system

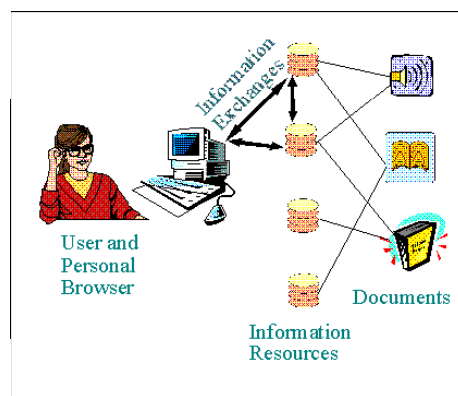


TEXT MINING



Dokumen
Teks

Pengetahuan



- ▶ Information Retrieval
- ▶ Text Categorization
- ▶ Information Extraction
- ▶ Question Answering
- ▶ Text Summarization