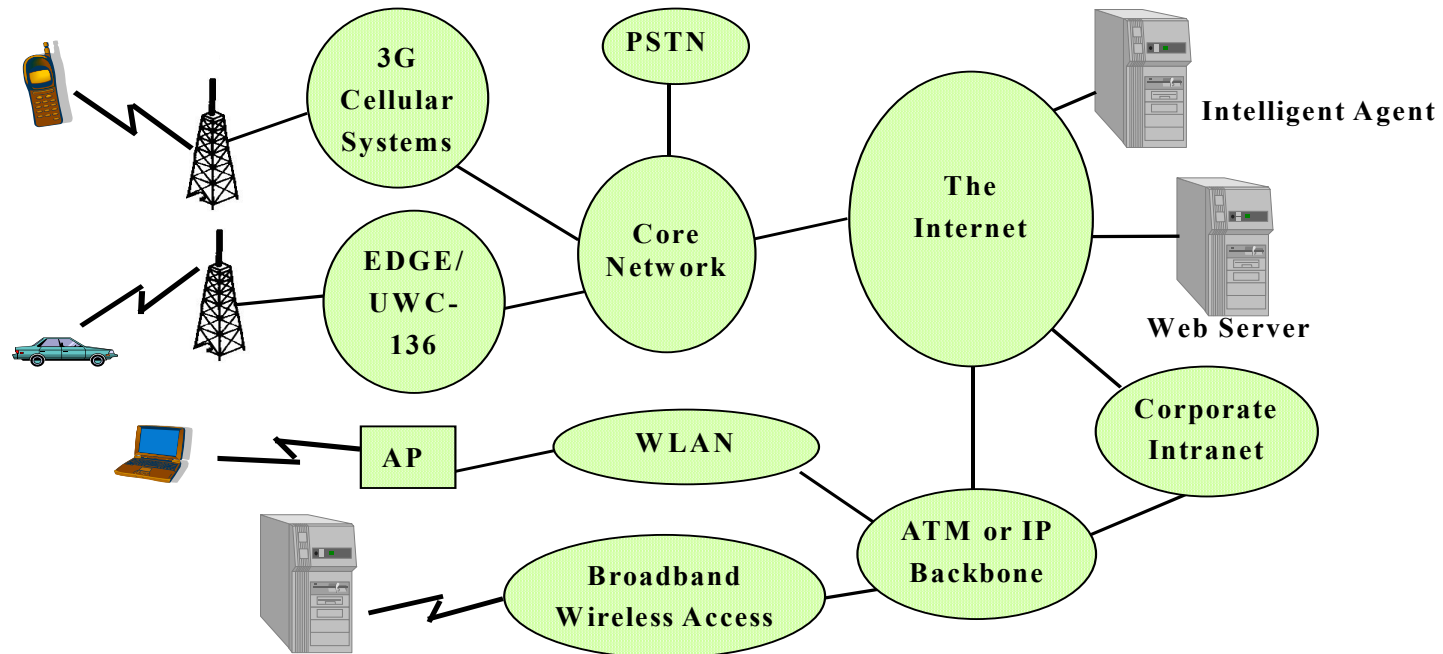# 17.0   Conclusion

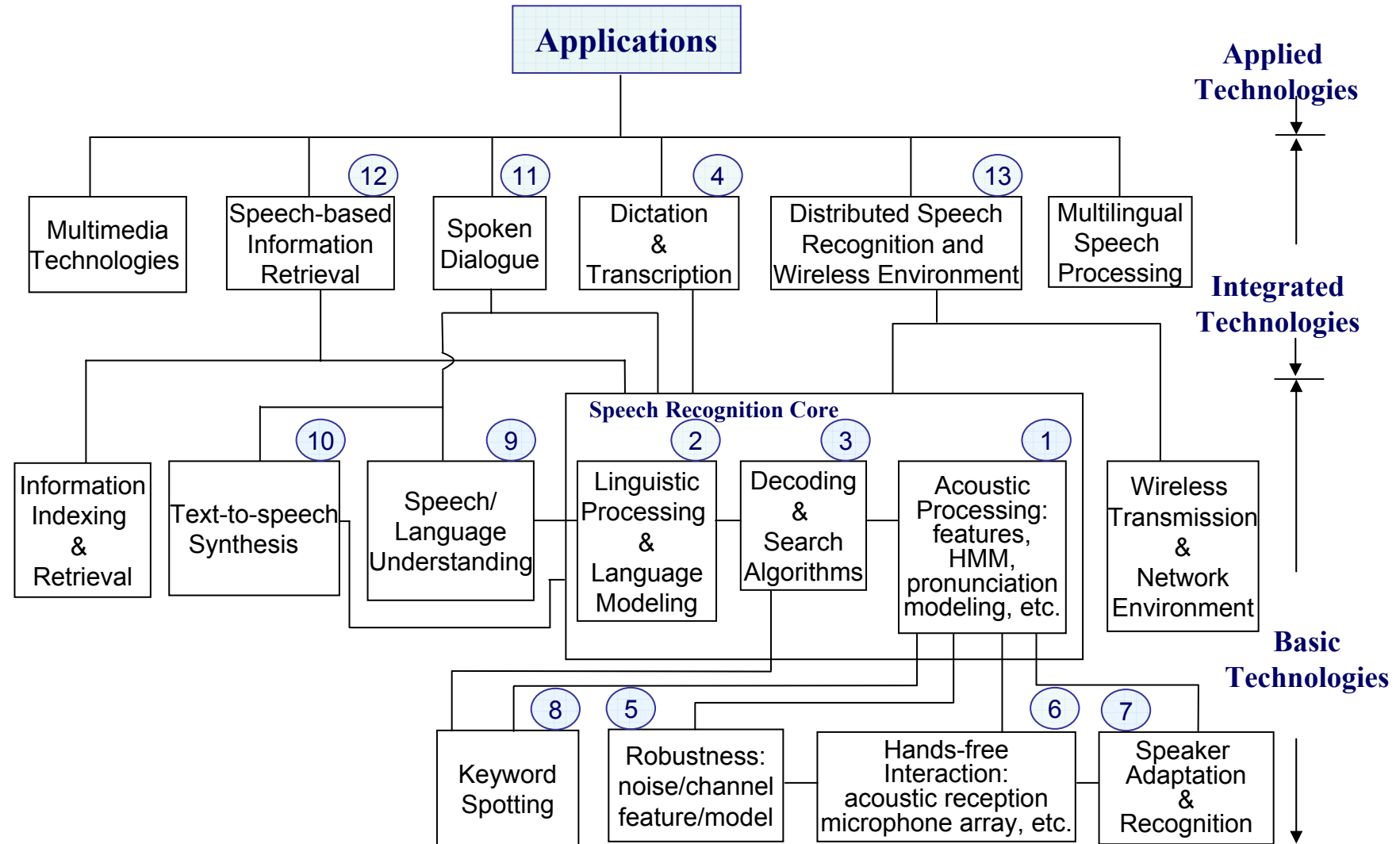**Reference**: "Special Issue on Spoken Language Processing", Proceedings of the
IEEE, Aug 2000

Voice Access of Global Information with Wireless

- **Global Information**
- **At Any Time, from Anywhere**
- **As Handset Size Shrinks While Required Functionalities Grows and the User Environment Changes, Voice Interface will be Useful for all Different User Terminals**
- **Integration of Many Different Technologies**
  - information processing, networking, transmission, internet, wireless, speech processing

Map of Subject Areas

Applications

Applied Technologies

Integrated Technologies

Basic Technologies

(12) Speech-based Information Retrieval

(11) Spoken Dialogue

(4) Dictation & Transcription

(13) Distributed Speech Recognition and Wireless Environment

Multimedia Technologies

Multilingual Speech Processing

Speech Recognition Core

(10) Information Indexing & Retrieval

Text-to-speech Synthesis

(9) Speech/ Language Understanding

(2) Linguistic Processing & Language Modeling

(3) Decoding & Search Algorithms

(1) Acoustic Processing: features, HMM, pronunciation modeling, etc.

Wireless Transmission & Network Environment

(8) Keyword Spotting

(5) Robustness: noise/channel feature/model

Hands-free Interaction: acoustic reception microphone array, etc.

(6) (7) Speaker Adaptation & Recognition

Concluding Remarks

- **Interdisciplinary Nature**
  - Digital Signal Processing, Perception Analysis, Phonetics, Linguistics, Natural Language Processing, Artificial Intelligence, Pattern Recognition, Statistics, Information Theory, Detection/Estimation Theory, Digital Communications, Information Retrieval, Wireless, Networks...
  - higher entry barrier with plenty of open space
  - the only missing link in a key technology chain
  - integrating mathematical models with programming
- **Speech is the Most Natural Communication Media for Human Beings with Unlimited Variety**
  - everyone speaks everyday
  - all sentences/utterances are different acoustically/linguistically
  - at least 4,000 different languages all over the world, at least 100 extensively used
- **The Time of Speech is Coming**
  - the post-PC era and wireless developments have created a perfect space for speech technologies
  - the opportunities and challenges are simply limited by your imagination