# Reaching New Horizons with Innovative Speech Technologies

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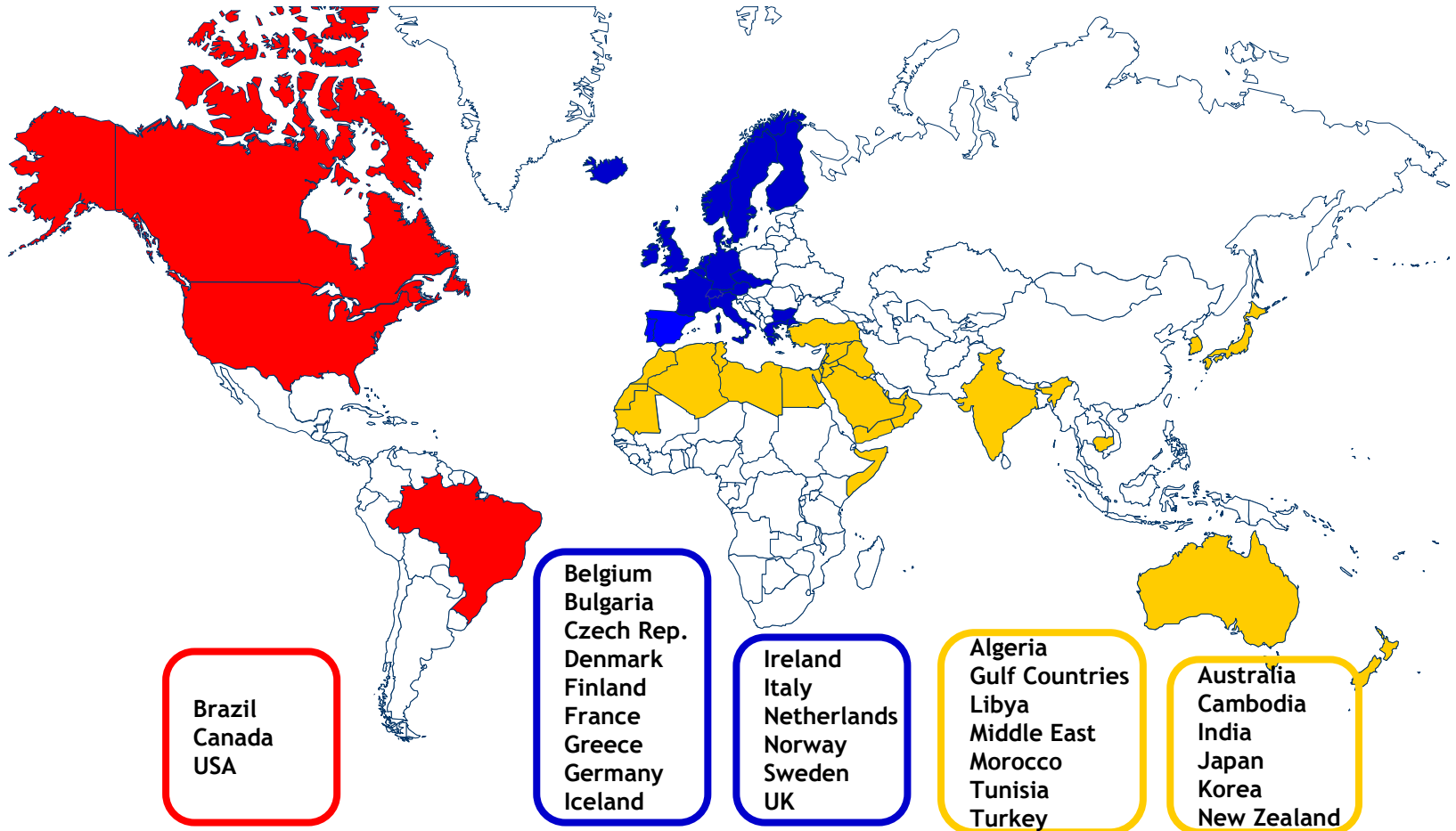- **Opening up new markets & applications**

# Who we are

- **Provider of Speech Solutions since 1997**
  - **Text-To-Speech**
  - **Speech Recognition**
  - **Professional Services**
- **Expertise in six market segments :**
  - **Telecommunications**
  - **Assistive technologies**
  - **Multimedia**
  - **Mobile devices**
  - **Automotive**
  - **Industrial**

# Geographical perspective:
## 19 languages; > 25 countries

**BABEL** Technologies **INFOVOX**

Brazil
Canada
USA

Belgium
Bulgaria
Czech Rep.
Denmark
Finland
France
Greece
Germany
Iceland

Ireland
Italy
Netherlands
Norway
Sweden
UK

Algeria
Gulf Countries
Libya
Middle East
Morocco
Tunisia
Turkey

Australia
Cambodia
India
Japan
Korea
New Zealand

# Current ASR & TTS market offering

| Technology | Market | Telecom | PC/MM | Embedded | | |
|---|---|---|---|---|---|---|
| | | | | Ind | Auto | Mobile |
| TTS | Formant | ( | | x | x | x ) |
| | Diphone | ( x ) | x | x | x | x |
| | Unit Selection | x | x | x | x | |
| ASR | Small vocab. C&C | | | X | x | x |
| | Medium vocab. C&C | x | x | X | x | |
| | Large vocab. | x | x | | | |
| | Dictation | | x | | | x |

| X | General market coverage |
|---|---|
|  | Babel's offering |
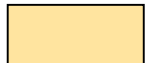
# Challenges of Current TTS Systems

- ## Application-specific text preprocessing
  - "CO-2" = Colorado Highway 2
  - "CO-RD 239" = County Road 239
  - "CO-PILOT LN" = Co-pilot Lane
  - "I-195 EAST/SR-112 WEST/AIRPORT EXPY" = complex text with slashes, abbreviations, etc.

- ## Pronunciation of proper names
  - "Thibodaux" = French origin, English language rules will fail
  - "Eichelbergertown" = long difficult name

- ## Voice quality & natural intonation

# Challenges of current ASR Systems

## ▪ Phonetisation & proper names

- "Belen" = Spanish origin, English language rules fail
- "Raton" = French origin, English language rules fail
- "Bourbonnais" = French origin, English language rules fail
- "Pesce Pasta Tre" = "Tre" is Italian

## ▪ Noise Robustness

- Performance decreases with noise level
- Vocabulary size decreases with noise level
- Specific adaptation of the ASR engine to the environment

# Challenges of current ASR Systems

- **Spontaneous speech & Mispronunciations**
  - Users are human beings !
- **Grammar dependency**
  - ASR systems are using limited, predetermined grammars (VXML)
- **General accuracy**
  - Very good in "nominal" usage.

# Opening up new markets & applications

- ## Automotive – Navigation Technologies

  - ### Description of customer problem :

    - Accurate Text-To-Speech and Speech Recognition for Navigation systems

  - ### Description of Solution

    - Development of production tools for efficient phonetization of proper names
    - Multiple pronunciations
    - Manual check of each proper name

  - ### Result :

    - Hundreds of thousands names manually checked
    - Demonstrations presented in Frankfurt, Madrid, etc.

# Opening up new markets & applications

- ▪ **Public Announcements – Fulltec**
  - **Description of customer problem :**
    - Broadcast of variable, repetitive messages
  - **Description of Solution**
    - High quality Text-To-Speech
    - Corporate voices
    - Combined usage of recorded prompts and Text-To-Speech
  - **Result :**
    - First deployments in supermarkets

# Opening up new markets & applications

- ## Multimedia (language learning) – Klett

  - **Description of customer problem :**
    - Correction of pronunciations of the students

  - **Description of Solution**
    - Advanced speech recognition modeling pronunciation errors
    - Recognition at the phoneme level
    - Detection of intonation

  - **Result :**
    - Accurate feedback to the students
    - Specific pronunciation exercises

# Opening up new markets & applications

- **SMS2Speech**
  - **Description of customer problem :**
    - Convert text SMS into speech to expand the usage of SMS.
    - No solution handling the "SMS language"
  - **Description of Solution**
    - Specific dictionaries (CU = see you)
    - Specific text preprocessor :
      - HAND = Have a nice day
    - The SMS language is changing : Need for frequent updates
  - **Result :**
    - Improved conversion of SMS
    - Deployment of the solution on December 1, 2003

# Conclusion

- **Speech Technologies work well and are deployed**

- **A good understanding of the problem is needed in order to deploy a good solution**

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### Technologies
# INFOVOX

# Thank you for your attention!