

# The Use of Virtual Speech Agents in Healthcare

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# Recent Focus

- Focused on human-human dialog
  - Natural speech
  - Noisy environments
  - Very little data available
  - Achieved 99% accuracy in clinical hospital environments
  - Studies in Kaiser and UCSF



# Fluential Technology Tracks

## Speech Translation



Talking to People

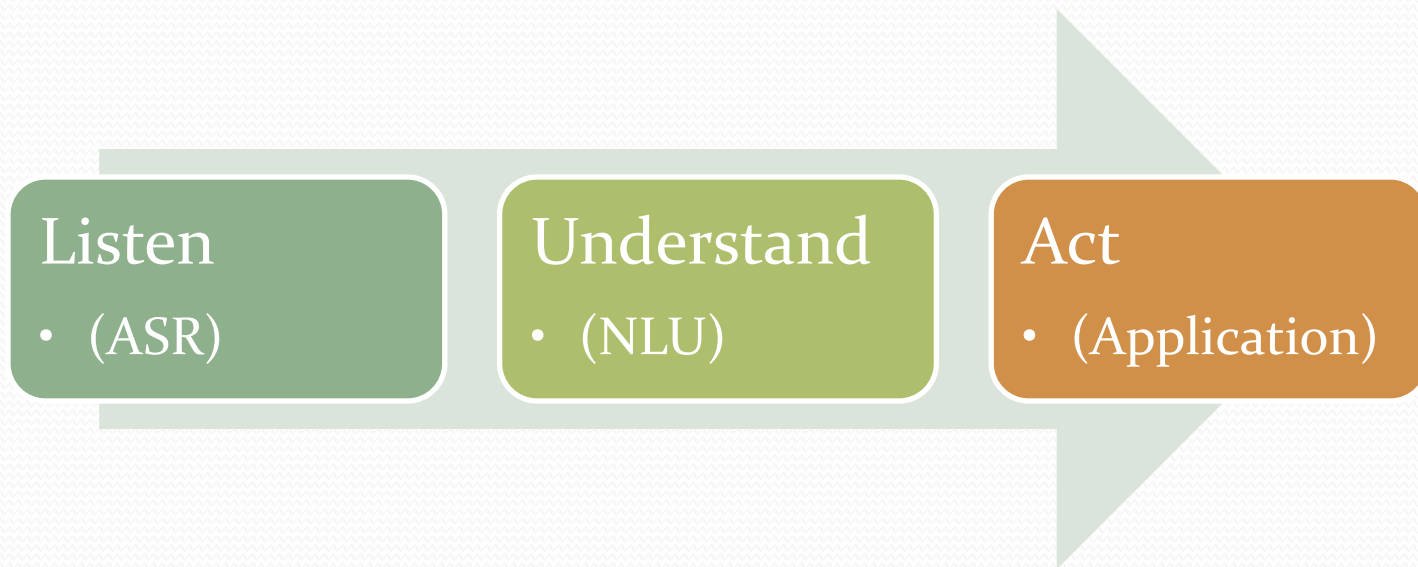
## Conversational Interfaces



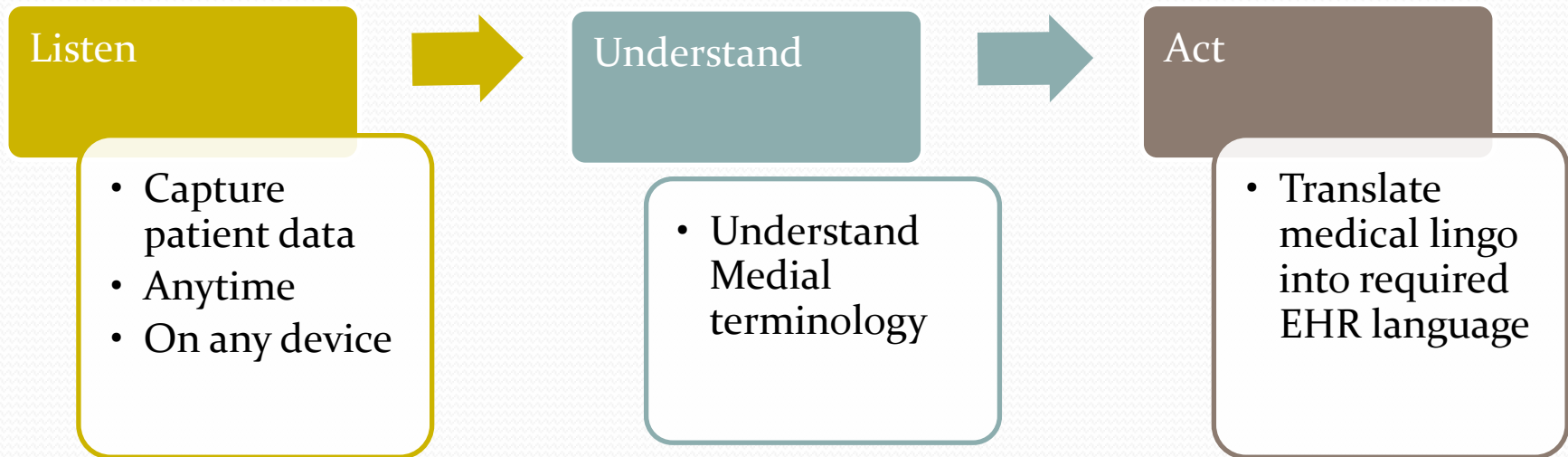
Talking to Devices

# Virtual Speech Agents

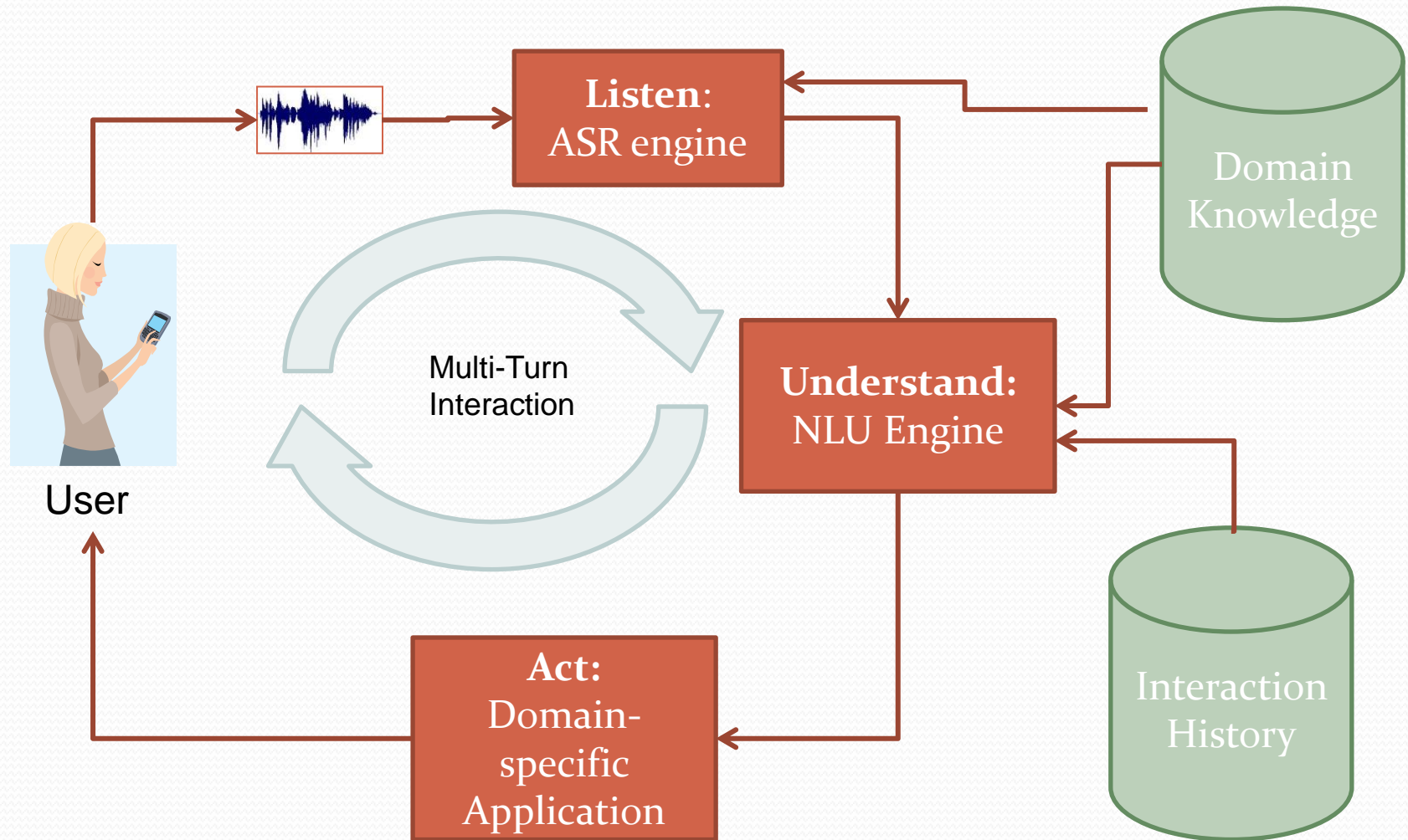
Overarching principle, common to all domains:



# Healthcare Specific Needs



# Virtual Speech Agent: Dialog Architecture



# Virtual Speech Agent

## Necessary Features for Success

Real-time responses  
Robust, Scalable  
Rapid Development  
Multi-turn, complex conversations  
Device independent  
Smart preference learning

# Healthcare Design Considerations

## (1) Usability:

“How do users know what to say?”



- Large percentage of medical professionals are familiar with speech (dictation)
- Repeated users
  - Can be trained overtime
  - Biased towards continuous dictation and speaking naturally
- Can use hints during initial sessions



# Healthcare Design Considerations

## (2) End-pointing

“When is the user speaking?”

- Three options:
  1. Push-to-talk, push-to-stop or hold-to-talk
  2. Wake-up phrases, earcons
  3. Continuous listening



# Healthcare Design Considerations

## (3) Optimizing Accuracy:

“How can accuracy be improved?”

1. Noise robust system
2. Noise cancelling microphones
3. Teach users the system's capabilities
4. Alternative modality for input



# Healthcare Design Considerations

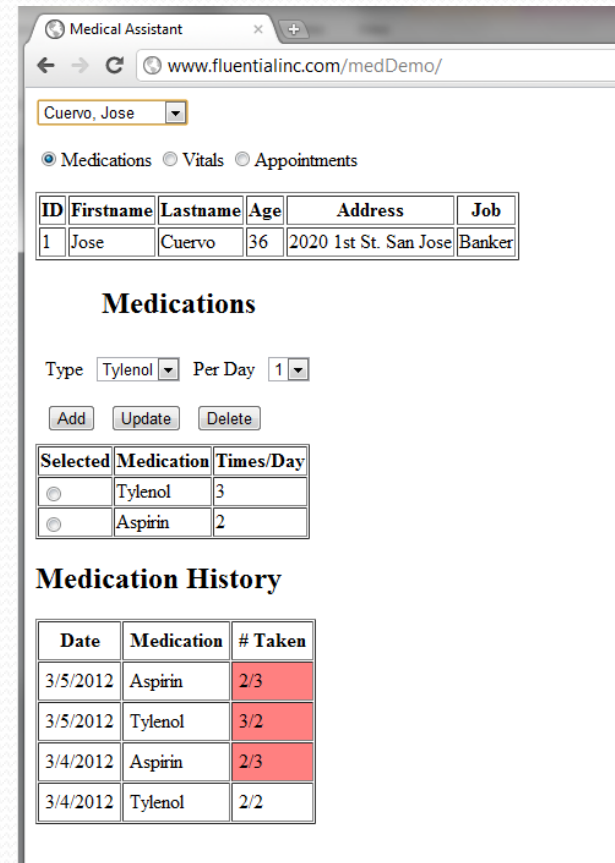
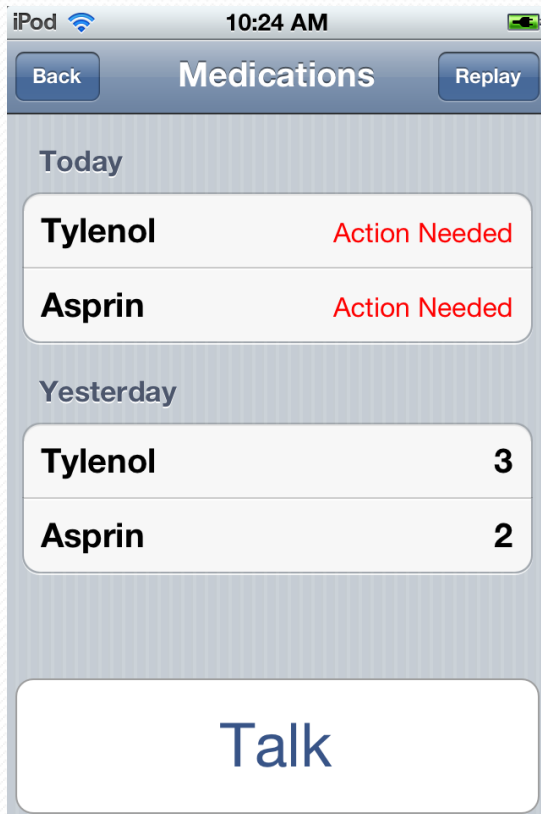
## (4) Graceful Error Recovery:

“How can misrecognitions be handled when they do occur?”

Use confirmations (oral/visual) for critical data like medicines and dosages

The oral feedback should augment the visual feedback and not just re-iterate it

# Demonstration



Mobile Device: Data capture anywhere

Data Integration with health care IT system



Q & A

Thank you