

# Voice Search as an enhancement to traditional IVR applications

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# Background

- Inference Communications
  - Specialists in natural language applications.
  - Performance based approach to measuring the success of applications.
- Tradition IVR = Speech IVR
  - Transaction based
    - Telephone booking and ordering
    - Parcel and order tracking
    - Location based services
  - Linear dialog flow with or without *mixed-initiative* support.



# Measuring performance

- There are a number of measures that companies use to measure the performance of their apps.
  - Transaction Completion Rate (TCR)
  - ‘No excuse’ automation rate.  $(\text{total calls in} - \text{calls out}) / (\text{total calls in})$
- As an owner or operator of a speech application all that really matters is:
  - Did the caller have their query or transaction automated?
  - Which implies that the caller did not call back a second time and implies that the caller did not give up altogether and take their business elsewhere.
- Often a speech application “works” but the caller still transferred to an operator?
  - Frustrating for the developer
  - Request was ‘out-of-scope’



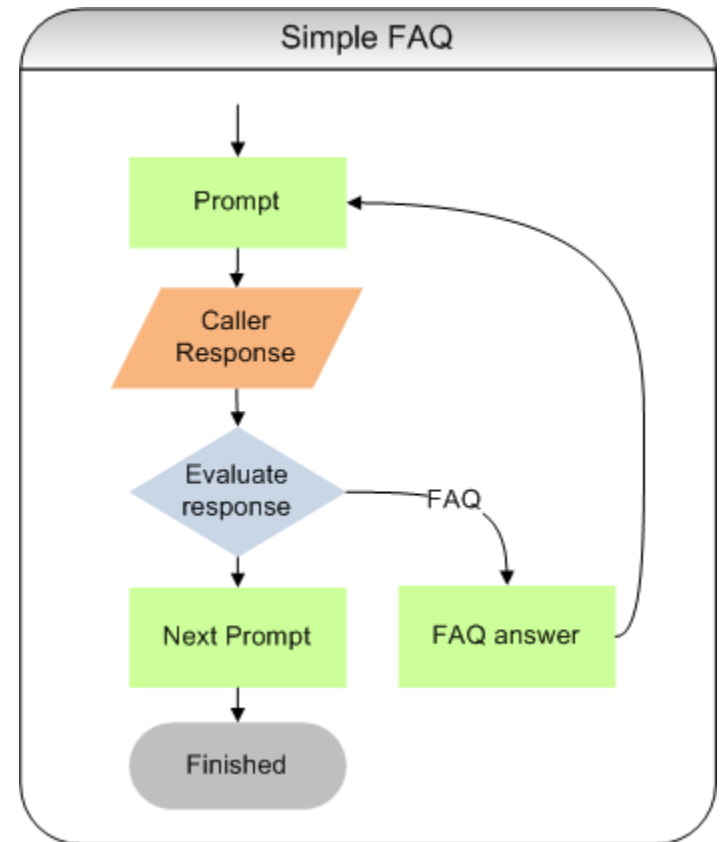
# Enhancing dialog with FAQ's

- A common strategy to improve the automation rate.
- The concept of a speech FAQ is simple:
  - Sometimes when you ask the caller a question they respond with a question rather than an answer.
  - A classic example would be a train ticket ordering system:
    - **System**> What station would you like to leave from?
    - **Caller**> Am I able to bring my bicycle with me?
    - **System**> Bicycles and surfboards may be carried free on trains. Passengers travelling with bicycles or surfboards are requested to avoid using peak hour trains where possible.
    - **System**> What station would you like to leave from?



# Benefit of the FAQ

- FAQ's are a mechanism used to increase the effectiveness of a speech application.
- Reasonably easy to implement:
  - A grammar that operates in parallel with the main dialog and returns the callers to same point they were at before asking the question.
- However for many applications simple FAQ's do not go far enough....



# FAQ Limitations

- Simple FAQ's are often:
  - Context-less
  - Single slot
- For many applications this is not sufficient.
  - Consider an airline booking system
    - **System**> You wish to travel from Sydney to Los Angeles on the 27<sup>th</sup> February 2009. Is this correct?
    - **Caller**> Is it possible to get a stop over in Hawaii?
- This type of interaction is much more difficult.



# Incorporating search into design

- Incorporating ‘search’ is a step beyond the FAQ.
  - Must capture and preserve context and state.
  - Search
    - Extract the search information criteria.
    - Perform the lookup
    - Interpret and format the response.
    - Return the information
  - Restore the state of the application and continue.
    - **System>** You wish to travel from Sydney to Los Angeles on the 27<sup>th</sup> February 2009. Is this correct?
    - **Caller>** Is it possible to get a stop over in Hawaii?
    - **System>** Unfortunately a stop over is not available ...



# Search as an enabler

- Enhancing a transactional application with search can be the difference between success and failure of an application.
  - High content web applications.
    - Fantasy Football. “Is XYZ injured?”
  - Applications where the *information needs* of the caller are high.
    - Stock trading. “What was the close yesterday?”
  - Callers context is important
    - Store locations. “I want to go on Saturday but I only want outlets that offer same day service.”







# Case Study - Background

- ‘Footy Tipping’ at the Australian Football League
  - AFL is the dominant sporting code in Australia.
  - Tipping is like betting but without money (‘glory’).
    - Pick the winner of each game of each round.
    - Pick the winning margin.
  - Many hundreds of thousands of participants every year.
  - Almost 100% of all tipping competitions conducted via the web.
    - Perfect example when the participant has high *information needs*.
    - Largely statistics driven decision making.





# 'Footy tipping' interactions

- Things a caller may want to know:
  - Where are the teams playing? What stadium?
  - Who's *home* game is it?
  - Where are the team on the ladder?
  - What are other people tipping?
  - What is the win/loss record of one team against the other?
- 100% repeat callers. Most users will ring every week of every round.
  - A good caller experience was essential.





## The result...

- For Inference this was the first time we had employed search as an overlay on a transactional style system.



What did it sound like?

- Note how for each question I respond with a question rather than an answer.
  - Exaggeration for the purposes of the demo.





# Findings

- Findings from the proof-of-concept
  - Education about what was possible was required.
    - Added a parallel series of ‘Instructional FAQ’s’
  - More features added over time
    - Despite our best efforts there were still unexpected queries.
- Unintended benefits
  - Some callers would ring more than once per round (use the service like an updatable list).
- Customer very happy.



# Conclusion

- The term 'speech search' spans a broad spectrum of ideas.
- Traditional Speech IVR applications can benefit from it.
  - Do you know why your callers are going to operator?
  - A minor improvement can make a big difference.
- Some traditional applications would be unviable without it.
- They can be tricky to design and build however there are development environments that support it.



Thank-you

