COMP349
Spoken Language Dialogue Systems
Telebet Express: A Case Study

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Today’s Program

• Industrial Background
• Application Requirements
• Telebet Express
• Types of Bets
• Task Description
• Dialog Description
• Preparing and Supporting the User
Industrial Background

- Horse racing has been a major industry in Australia since the 1920s.
- The wagering industry was operated by TAB, a state-owned company.
- In the 1980’s, Tabs began selling bets over the phone.
- Live operators handled the majority of calls.
- DTMF systems were hard to use (letters and place names in dialogs).
- About 10% of the adult population has telephone betting accounts.
- About half of those place more than 10 bets per week over the phone.
Industrial Background

- The phone business took off with racing on cable TV in 1995.
- Calling pattern of the bettors are very spiky.
- Most calls come in just before the race starts.
- Once the race begins betting is over.
- Each bet placed is money for TAB (which takes 15% of the top).
- A lot of calls were busying out at peak time.
- TABQ and the eight other TABs in Australia were privatized in 2000.
Industrial Background

- The telebet side of TABQ boasted 100,000 account holders.
- TABQ had two call centres with up to 500 live operators.
- Over a full year, TABQ handled about 13.4 million calls.
- Telephone betting is account based:
  - You put money into your account with Visa Card.
  - Losses are debited, winnings are credited against the account.
- Problem: Long queues prior to the start of each race.
- Solution: Using an automated telephony-based SLDS.
Application Requirements

• Customer satisfaction was TABQ’s prime concern.
• TABQ’s callers were used to talking to live operators.
• However, most bets were placed by frequent users.
• 50% of the users called in more than 10 times a week.
• Many bets are placed over wireless phones at noisy pubs.
• Coverage of all Australian dialects were required.
• Requirements:
  – task completion rate of 95%
  – call length 110% of agent-assisted call time
Telebet Express

• Telebet Express is a telephony-based SLDS.
• It accepts wagers such as (example):
  * Sydney racing, race 4 Trifecta, number 2, 3 and 8 for 5 dollars*
• It allows for over 300 wagers to be placed simultaneously.
• It processes over 500,000 bets successfully each month.
• It has a task completion rate of over 97 per cent.
• ROI was enormous.
• In general, speech apps work well (in limited domains).
Telebet Express – Web Page

Telebet Express is a fast and convenient way to place your bets that provides you with the added bonus of being a part of a Rewards Program. Telebet Express also allows you to bet the operator queue and get your bets on immediately.

To listen to a demonstration of bets being placed with Telebet Express, call 1300 800 620. You’ll be amazed at how easy it is to use!

Click here for hours of operation.

HINTS AND TIPS

- To place your bets with Telebet Express call 13 19 32.
- Listen to a demonstration of Telebet Express before using it the first time.
- Speak naturally and clearly.
- Call your bet in one sentence without pauses.
- It will help to write your bets down before calling.
- Try to avoid “ums” and “ahs”.
- Say “Start again”, “Cancel!” or “Operator” if there is a problem.

BET TYPES

All bet types are available except Footy TAB and Sportbets.
Types of Bets

- TAB offers about a dozen different types of race bets.
- The five most common types comprise 60-65% of all bets.
- A “win” bet pays only if the horse wins:
  * Sydney Racing, race two, number four, five dollars a win.
- A “place” bet pays if the places first, second or third are correct:
  * Adelaide Trots, race six, number eight, two dollars to place.
- An “each way” bet pays for a win and place bet simultaneously.
  * Geelong, race one, number five, a dollar each way.
Types of Bets

• A “quinella” picks the first and second runners in a race, in either order:
  
  *Brisbane Racing, race one, quinella, two and five for a dollar.*

• Boxed and banker versions allow multiple combinations:
  
  *Brisbane Racing, race one, boxed quinella, two, five, eight and twelve a dollar.*

  *Brisbane Racing, race one, a quinella, two the banker from five, eight and twelve for two dollars fifty.*
Types of Bets

• A “trifecta” picks the first three finishers in order:
  
  Randwick, race five, a trifecta, two, five and twelve for a dollar.

• Boxed and banker version:
  
  Randwick, race five, boxed trifecta, two, five, eight, nine and twelve a dollar.

  Randwick, race five, a trifecta, runners two and three to win, with two three and eight for second, five, eight, ten and twelve for third, for a dollar.
Patterns

- Identifying call patterns:
  *Randwick, race five, a trifecta, two, five and twelve for a dollar.*

- Five pieces of information need to be collected to sell at bet:
  - racing venue => *Randwick*
  - race => *race five*
  - type of bet => *trifecta*
  - horses => *two, five and twelve*
  - amount => *for a dollar*
User Interface Design Issues

• What is better:
  – Prompting the caller for a full bet sentence?
  – Collecting the bet components one by one?
• Call length requirements could only be satisfied by full sentences.
• Appen transcribed several thousand calls.
• There was a lot of sentence complexity.
Sentence Constructions

• Common constructions:

*Randwick, race five, a trifecta, two, five and twelve for a dollar.*

*Randwick, a trifecta, race five, two, five and twelve for a dollar.*

*Randwick, race five, a trifecta for a dollar, two, five and twelve.*

*Randwick, a trifecta for a dollar, race five, two, five and twelve for a dollar.*
Sentence Constructions

• Infrequent constructions:

A trifecta, *Randwick, race five, two, five and twelve for a dollar.*

*Randwick, race five, a dollar trifecta, two, five and twelve.*
Observations

• 120 possible ways to combine the bet components in a trifecta.
• Just a few sentence constructions cover 80% of the bets.
• For example, the final grammar allows only 4 ways to combine the bet components in a trifecta.
• Reduced complexity is very important.
• No individual component has a large number of choices.
Individual Components

- Race venue has the most choices (a few hundred track names but at most 50 open on a given day).
- Race numbers restricted to one through twelve.
- Horse numbers restricted to one through twenty-four.
- Amounts restricted to whole and half dollars.
- The speech recogniser has relatively few possibilities to choose from.
- Transcriptions were important for scoping the grammar task.
- Building and refining the grammar was very important.
Modelling the Operator

• It was natural to ask the user in the same way as the operator did.
• Most target users had talked with operators hundreds of times.
• But few users had ever talked to a speech system.
• It is not a good idea to give the users the impression that they can freely converse with the system.
• Application was imbued with the personality and prompting language of a TABQ operator.
Login

- Every account had a four letter security code.
- Half of the callers spoke their security code in the same utterance as their account number:
  
  *Account’s five double two oh one and the code’s l u c k.*

- TABQ decided to go with a machine-directed dialog:
  - *Your account number please.*
  - *Please spell your code.*
• Letters are much harder to recognize than digits.
• A grammar for free letter sequences contains many more possibilities than for a digit string.
• Many letters sound alike:
  – (bee, pee), (dee, tee), (es, ef), (em, en)
• In general:
  – spelling works well when you know what to expect,
  – spelling does not work well for free letter sequences.
Task Description

• Account holders call in.
• Agent greets the caller and asks for the account number and security code.
• The agent announces the balance and asks for the first bet.
• The caller gives all or most of the information.
• The agent prompts the caller for missing information.
• The operator calls back the bet in a standard format.
• The caller either confirms or just continues.
• When done betting, the caller says “that’s all” (or something similar), hears the total costs, and says goodbye.
Dialog Description

- Welcome (no recognition)
  
  *Telebet Express.*

- Get Account Number
  
  *Your account number please.*

- Get Security Code
  
  *Please spell your code.*

- Announce Account Balance (no recognition)
  
  *Balance, twenty three dollars fifty cents.*
Dialog Description

- First Bet
  
  *First bet please.*

- Bet Completion Loop
  
  *OK, what’s the rest of it?*

- Bet Callback (allow barge-in to reject or correct, but not to confirm)
  
  *The bet is …*

- Bet Confirm (strict ‘yes’ required to confirm)
  
  *… Is that right?*
Dialog Description

- Announce Bet Status (no recognition)
  
  *Bet sold.*

- Next Bet Loop
  
  *Next bet please.*

  Bet Completion, Bet Callback, etc., until caller says “that’s all”

- Announce Total Cost (recognize only anguished cries)
  
  *All bets three dollars.*

- Goodbye (recognize only anguished cries)
  
  *Thank you. G’bye.*
How to Convince the User

• Statements on Telebet Express’ Web page:

  Telebet Express is a fast and convenient way to place your bets that provides you with the added bonus of being a part of a Rewards Program.
  Telebet Express also allows you to beat the operator queue and get your bets on immediately.
  To listen to a demonstration of bets being placed with Telebet Express, call 1800 800 620. You’ll be amazed at how easy it is to use!
How to Use Telebet Express

- The following hints and tips are available for the user:
  - To place your bets with Telebet Express call 13 19 32
  - Listen to a demonstration of Telebet Express before using it the first time.
  - Speak naturally and clearly.
  - Call your bet in one sentence without pauses.
  - It will help to write your bets down before calling.
  - Try to avoid "ums" and "ahs".
  - Say “Start again”, “Cancel” or “Operator” if there is a problem.
  - Telebet Express works best if you call your bet in one sentence without pauses.
How to Use Telebet Express

– Always listen to the prompts carefully and answer the questions asked.
– Eg. When asked "What's the Meeting?" only give the meeting but if the prompt asks "What's the bet?" you can give the whole bet.
– When you hear Telebet Express ask "First bet please" call your bet based on the examples over the page:
# Hints and Tips: Examples

## Telebet Express Recommended Call Order

<table>
<thead>
<tr>
<th>Racing Bet Example</th>
<th>Bet Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Harold Park race 1 number 8 one dollar to win&quot;</td>
<td>Win bet</td>
</tr>
<tr>
<td>&quot;Flemington race 3 number 10 two dollars a place&quot;</td>
<td>Place bet</td>
</tr>
<tr>
<td>&quot;Gold Coast race 2 numbers 2, 5, 7 and 11 at 2 dollars a win and 3 dollars a place&quot;</td>
<td>Win and Place bet</td>
</tr>
<tr>
<td>&quot;Eagle Farm race 7 numbers 3 and 11 five dollars each way&quot;</td>
<td>Each Way bet</td>
</tr>
<tr>
<td>&quot;Ballarat race 5 quinella numbers 2 and 9 at two dollars&quot;</td>
<td>Quinella - single</td>
</tr>
<tr>
<td>&quot;Gold Coast race 2 box quinella numbers 3, 5, 6 and 7 at a half&quot;</td>
<td>Quinella - boxed</td>
</tr>
<tr>
<td>&quot;Doomben race 6 banker quinella 3 as the banker from 1, 7, 8 and 9 at two dollars&quot;</td>
<td>Quinella - banker</td>
</tr>
<tr>
<td>&quot;Eagle Farm race 8 trifecta numbers 1, 3 and 6 at ten dollars&quot;</td>
<td>Trifecta - single</td>
</tr>
<tr>
<td>&quot;Wentworth Park race 2 box trifecta number 3, 7 and 8 at fifty cents&quot;</td>
<td>Trifecta - boxed</td>
</tr>
<tr>
<td>&quot;Ballarat race 2 banker trifecta number 5 as the banker from 3, 6, 7 and 12 at five dollars&quot;</td>
<td>Trifecta - banker</td>
</tr>
</tbody>
</table>
How Telebet Express Works

• Information on Telebet Express’ Web page:

If your bets are on the same race, after confirming each bet you can go straight to the next bet, without repeating the meeting and race number, as Telebet Express will understand this is your intention and copy the meeting and race number from the previous bet.
If Something Goes Wrong

- If one of your selections is scratched, Telebet Express will tell you and ask for the selections again.
- If you don't want the bet, say "Cancel".
- Or you can call all your selections again with or without a replacement selection.
Take-Home Messages

- Reduction of the task complexity is essential in SLDS design.
- Transcription of user data is important for grammar writing.
- ASRs can handle long sentences if choices at each point are limited.
- Callers who are used to operators will accept SLDS.
- SLDS needs to be introduced carefully.
- SLDSs can work successfully in limited domains.