Managing Complexity: 3rd Generation Speech Applications

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SpeechCycle

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Evolution of Complexity

1st Generation
INFORMATIONAL

2nd Generation
TRANSACTIONAL

3rd Generation
PROBLEM SOLVING

BANKING

PACKAGE TRACKING/RATES

FLIGHT STATUS

STOCK TRADING

FLIGHT/TRAIN RESERVATION

1994 2000 2006

10 100 1000

COMPLEXITY (NUMBER OF DIALOG MODULES)

Native Code

Proprietary Voice Platforms

Standard (VoiceXML) Voice Platforms

Standard Application servers

Static VoiceXML

Statistical Language Understanding

Dynamic VoiceXML

1994 1999 2006
A Paradigm Shift

• A tool for callers
  – And not a replacement of agents

• Better service
  – And not cutting customer care costs

• A live repository of knowledge
  – Continuous improvement vs. ship-and forget

• A Service Optimization Device
  – Added value of business intelligence
Speech 3.0
Defining features

- Know who is calling
- Know “how-to”
- Remote actions
- Natural language
- Sophisticated logic
- Work out-of-the-box

- Rapid deployment
- Keep improving
- Knowledge accumulation
- Business intelligence
- Collaborate with agents
Technical Support Challenges

- One-time callers
- Caller emotions
- Uncontrolled events
- Hostile environment

- Caller withdrawals
- Symptoms vs. problems
- World model mismatch
- Lack of trust
- High complexity logic
Managing Complexity

- Integrated design/development
- Arbitrary depth hierarchy (ADH)
- Property inheritance
- Event handling logic
- Link external modules
- Variables/WebServices/Scripting
- Global interaction features
- Speech hypotheses handling
- Timers/parallel execution
- Real-time call monitoring
- Call resumption engine
- Call back features
- Repeat caller functionality
- Personalization
- Automatic reporting
The Continuous Improvement Cycle

- **Analyze** call logs to find areas of the call flow with:
  - High frequency of hang-ups and help/operator requests
  - High speech recognition error rates
  - High AHT

- **Listen** to full call recordings to discover why:
  - Callers ask for “operator”
  - Callers abandon or hang up before troubleshooting
  - Reasons for speech recognition errors causing escalations
  - Callers spend longer than anticipated time in certain tasks

- **Transcribe** utterances to:
  - Compute accurate speech recognition performance
  - Improve speech recognition performance
  - Understand and categorize exactly what callers say and how they say it

- **Improve**
  - VUI
  - Grammars
  - Logic
Continuous Improvement in Action
Conclusions

• Three generations of dialog systems
  – Complexity, Architecture, Technology, Interaction type

• Speech 3.0
  – Paradigm shift
  – Advanced features
  – Managing complexity
  – Continuous improvement cycle
Empowering Your customers and employees with speech technologies

SpeechTEK 2006 Empower
The Voice Solutions Showcase

Thank You