Benefits of metalanguages for rolling out natural language applications
B204 – The role of standards

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summary

1. use case: the 800 service
   HD sound Voice Selfcare for DSL VoIP lines

2. A well known n-tier architecture
   and well known standards

3. tools and methodology for NL development,
   deployment and maintenance based on standards
1. overview of the 800 open in France since October 18\textsuperscript{th} 2007
the 800 service features

- a voice selfcare for VoIP lines
  - fully automated, available 24-7
  - accessible from any network
- used to configure telephony services
  - call forward (*always* or busy, and no response)
  - permanent Calling Line Identification Restriction (CLIR)
- supports Natural Language interactions or DTMF access
- with g722 (wideband) or g711 (narrowband) codec negotiation
- also accessible easily from an associated mobile
  - no explicit credentials required on future calls when the mobile has been associated to a VoIP line
typical scenario at home when calling the 800

Welcome to the 800 service, how may I help you?

Could you please forward my calls to my office?

Sure, your calls are now forwarded to your office number:
02 96 05 14 24.
Welcome to the 800 service, you are calling from a mobile. What is your home phone number?

09 66 99 00 66

Please dial your 4 digits home pin code now.

****

Thank you. Would you like to associate the mobile you are calling from to your home phone number 09 66 99 00 66?

yes

OK. Next time you call from your mobile I will recognize you automatically. Now, how may I help you?

I would like to cancel my call forward service
2. well known architectures and standards
The old monolithic approach

- Black box approach
- Works fine but …
- expensive updates and upgrades
- may be more efficient for CPU and memory usage depending of the application complexity
A well known n-tiers architectural model

VoiceXML Gateway → Application Server → Back-end

- Mobile
- SIP
- Wideband phone + DSL Modem
- Back-end (Databases, Transaction servers, Customer profiles…)
- SOAP SQL …
- Runtime metalanguages

HTTP/VXML
key elements used for the 800?

- VoiceXML 2.0
- N-gram raw speech recognition results + context
- recorded prompts or high definition TTS (16kHz)
- J2EE applications (JonAS application server)
- a runtime state engine
  - processing France Telecom metalanguage
- a semantic analyzer to process the speech recognition results

- and … development TOOLS!

- France Telecom Solution for advanced dialogs
obvious benefits for deployment with the n-tiers approach

- share procedures with web deployments
  - leverage the Operational, Administration and Maintenance (OAM) teams
  - reduced OAM costs
- open source or France Telecom solutions available
  - reduce licensing costs
- easy replacement of any tier of the architecture
  - reduce customization costs for deployment in different countries
- share platform resources for several applications
- but increased integration complexity that requires more standards, interchangeable tools and a well defined methodology
3. tools and methodology for the NL life cycle based on standards
Methodology for NL life cycle used for the 800

- service design
- developments
- deployment and runtime

N times and often

new features + service design upgrades

user behavior analysis
tools and "standards" for service design

- Dialog Design Studio: a GUI for service design
  - Top/Down approach when defining the service
  - Describe the functional features
    ➡️ output in a proprietary xml format: functional view
  - Describe the voice dialog interactions thoroughly
    ➡️ output in a proprietary xml format: technical view
  - The GUI needs to generate a human readable exhaustive specification
    ➡️ output in Open Office format
tools and "standards" for developments

- Dialog Code Generator
  - input: xml technical view + generic .jsp and servlets
  - automatic code generation
  - output: France Telecom metalanguage xml format + runtime java code

- Dialog Analyzer Studio
  - a GUI for semantic rules design
  - input: neurons and hard work 😊 + live traffic analysis
  - output: semantic interpretation rules
tools and "standards" for deployment and runtime

- VoiceXML gateway
- Dialog Engine on top of a J2EE application server
  - input: France Telecom metalanguage xml format + semantic interpretation rules
- Data logging
  - output: audio recordings and detailed path through the application
tools and "standards" for service improvements

- proprietary tools and database for call flows analysis
  - input: audio recordings and detailed path through the application
  - transcriptions, usability analysis, search, statistics
  - output: recommendations + feedback for service design upgrades
  - output: grammar tuning + semantic rules upgrades
Where standards help!

Mature standards:
- VoiceXML
- J2EE
- SOAP

Potential standards:
- Metalanguages (*) as inputs and output for development tools

Proprietary tools available

VoiceXML Forum Tools Working Groups efforts

N times and often:
- New features + service design upgrades
- User behavior analysis

Upcoming standards:
- Data logging
- Session Log Annotation Markup Language (SLAML)
Messages to bring home:
Key elements for successful Voice Search applications

- Top/Down approach with iterative steps
- Use existing and upcoming standards
  - avoid proprietary extensions and challenge the "good" reasons you may have to use proprietary extensions
- Development tools to help service designers working on features and to help technical experts tuning the technologies
  - Tools needs to share standard inputs and outputs for voice search to be successful
- You need a voice search button and good microphones
thank you

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